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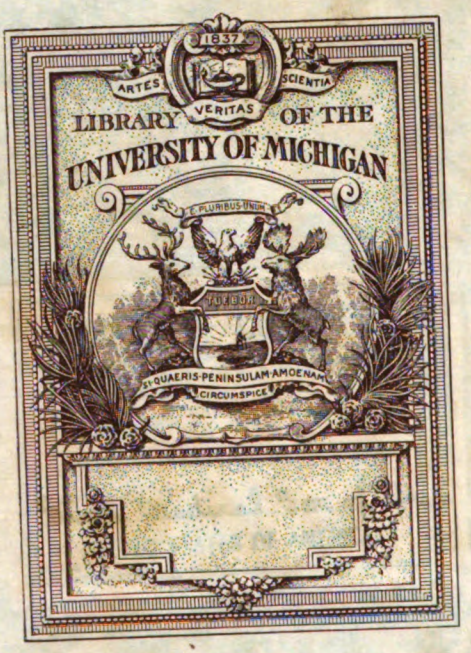

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VOLUME XXXII.

TRANSACTIONS

OF THE

State Medical Society

OF WISCONSIN.

FOR THE YEAR 1898.

CONSTITUTION AND BY-LAWS

AND

LIST OF MEMBERS.

MEDICINA NUSQUAM NON EST.

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NOTICE.

The next meeting of the Society will be held at Oshkosh, on the first Wednesday of May, 1899, beginning at 11:00 o'clock A. M.

The next meeting of the American Medical Association will be held in Columbus, Ohio, June 8-11, 1899.

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The publication of any paper is not to be understood as necessarily an endorsement by the Society of the views contained therein.

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STATE MEDICAL SOCIETY OF WISCONSIN.

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Practice	W. H. WASHBURN	Milwaukee.
Gynecology	W. E. GROUND	West Superior.
Obstetrics	J. R. BARNETT	Neenah.
Neurology	W. A. GORDON	Oshkosh.
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Pathology	J. S. REEVE	Appleton.
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1900.

F. W. EPLEY, W. H. EARLES, SAMUEL BELL.

1901.

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Julius Noer, H. B. Tanner, Charles S. Sheldon.

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M. J. White, W. F. Becker.

COMMITTEE ON EXPERT TESTIMONY FEES.

A. J. Burgess, W. H. Earles, G. D. Ladd.

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Minnesota—F. W. Epley New Richmond.
Illinois—B. J. Bill, Genoa Junction.
Michigan—Ralph Chandler, Milwaukee

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SUGGESTIONS FOR 1899 MEETING

AND

IMPORTANT ANNOUNCEMENT.

PLEASE READ CAREFULLY.

To the Members of the Wisconsin State Medical Society:

For some years past much of the value of the scientific sessions of the Society has been lost owing to the large number of papers presented, making it necessary to rush the reading of papers and allowing very little time for discussion, in fact shutting out the discussion of many valuable papers altogether.

To remedy this evil, only two ways seemed open; either to divide the Society into two or more scientific sections to meet in different localities at the same time; or, to limit the number of papers placed on the program to such an extent as to secure ample time for their reading and discussion.

The former plan does not seem to find much favor among the members at the present time, and there are certainly some weighty objections to be urged against it. In order to put the latter plan to a practical test, the Society unanimously adopted the following resolutions, at the same time instructing its officers to make such alterations as they may deem advisable.

Resolved, That it is the sense of the members of the Wisconsin State Medical Society that the scientific program be restricted to a number of papers not to exceed fifty for any one meeting;

That the Program Committee be instructed hereafter to accept not to exceed fifty (50) papers for any one meeting of the Society. One-half to be read by invitation; one-half by volunteers;

That the officers of each section are hereby directed to invite members of the Society to contribute papers to be known as "Papers by Invitation," the titles of which are to be submitted according to previous usage, but which may or may not be submitted for approval, at the discretion of the Program Committee, until the date of the meeting, and other papers to be known as "Volunteer Papers," which may be offered by any member of the Society;

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That the Program Committee is hereby directed to receive these Volunteer Papers which are to be in the hands of the Chairman of the Program Committee four weeks before the meeting, to be examined by him and the members of the Program Committee, and to be accepted or rejected according to their merits;

That the officers of the sections are directed to appoint one or more members to open discussion on each paper;

That the number of papers is to be apportioned as follows:

Committee.	*Invitation.*	*Volunteer*
Surgery	4	4
Practice of Medicine	4	4
Gynecology	2	2
Obstetrics	2	2
Neurology	2	2
Ophthalmology and Otology	3	3
Laryngology and Rhinology	2	2
Pediatrics	2	2
Materia Medica and Therapeutics	1	1
State Medicine and Hygiene	1	1
Pathology	1	1
Medico-Legal Section	1	1
Total	25	25

In accordance with the above resolutions the officers of the Society, together with the Chairman of the Program Committee, have agreed on the following plan of work for the ensuing year.

I. Papers by Invitation.

1. These are to be furnished (*a*) by the chairmen of the various committees, and (*b*) by members of the Society by invitation of the committee chairmen.

2. The committee chairmen are to consider themselves invited to read papers, but it is left optional with them to do so, or to secure the number of papers allotted to their section from other members.

3. The titles of all "papers by invitation" should be sent to the committee chairmen, at least four weeks before the date of meeting.

II. Volunteer Papers.

All members of the Society who have anything of value and interest to offer are cordially and earnestly requested to send in volunteer papers, subject to the following conditions and those set forth in the above resolutions:

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1. The *manuscript* of all such papers must be in the hands of the Secretary, *Dr. C. S. Sheldon, Madison, Wis.*, at least *four weeks previous* to the annual meeting.

2. The manuscript is not to bear the name of the author, but to be designated by a motto, the key to which is to be sent to the Secretary at the same time in a sealed envelope. The Secretary shall forward each paper to the Chairman of the Committee to which it belongs, after destroying the postmark or any other possible mark of identification on the manuscript, and shall have no part whatever in the decision as to the acceptance of such papers.

3. The Chairman of each Committee shall select the papers to be read before the Society, subject to the approval of the general program committee.

4. After the Program Committee has taken final action on the papers submitted, they shall be returned to the Secretary of the Society for identification.

III. General Conditions and Recommendations.

1. Begin your work early, at once. Do not forget that all volunteer papers must be in the hands of the Secretary at least four weeks before the annual meeting. Send them earlier if ready.

2. Be prompt in your correspondence. Failure in this respect often causes great annoyance to those having the work in charge.

3. Make your paper brief and to the point. Papers requiring over twenty minutes must be read by abstract. Short and pithy papers, followed by animated and thorough discussion, can not fail to make our meetings attractive to all.

4. All papers must be typewritten, punctuated, and paragraphed, and cuts illustrating them will be inserted at the expense of the author.

5. The authors of all papers, both volunteer and by invitation, are requested to designate three members of the Society whom they wish to open the discussion on their papers.

6. In order to give this new departure a fair trial and a successful issue, it is hoped that *all* will cordially coöperate, especially in offering *volunteer papers*. Some have expressed the fear that the

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plan may not work well in this respect. Let us see to it that this fear shall not be realized. It is not necessary to appeal to the loyalty of the members, and their love for the Society, to secure abundant and worthy material for this part of the program.

For further information address letter with stamp inclosed to the Chairman of the Program Committee.

DR. H. V. WÜRDEMANN,
128 Wisconsin St.,
Milwaukee, Wis.

By order of the President:
DR. H. REINEKING,
906 N. Eighth St.,
Sheboygan, Wis.
DR. CHAS. S. SHELDON, *Secretary*,
Madison, Wis.

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TRANSACTIONS

OF THE

State Medical Society of Wisconsin

FOR 1898.

FIFTY-SECOND ANNUAL SESSION.

THE STATE MEDICAL SOCIETY OF WISCONSIN met in its Fifty-second Annual Session at the Plankinton House, Milwaukee, on Wednesday, May 4, 1898, at 11:00 o'clock A. M.

The meeting was called to order by the President, Dr. William Mackie.

The proceedings were opened with prayer.

Dr. Wingate, Chairman of the Committee of Arrangements, then presented the following report:

Mr. President and Gentlemen: As you will see by the program, it has been decided to have no sessions during Wednesday and Thursday evenings. The program will be followed to-day as printed, and members can have this evening to themselves for such purposes as they desire.

To-morrow the program will be followed as printed, and to-morrow night at 7:00 o'clock will be the banquet in this house. It is desired that all members procure tickets for the banquet of the Treasurer, as no one will be admitted to the banquet without a ticket.

On Friday the program will be continued as printed. Members are requested to hand their railroad tickets to Dr. Hol-

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brook, the Assistant Secretary, as early as possible, in order to receive the necessary signatures to get the one-third rate back.

Should any member be unable to find what he wants, if he will announce it to any of the members of the Committee, we shall be glad to be at your service at any time.

The President: As we have a long program this year, I will have to ask you to make your discussions short.

Dr. William Meacher, of Portage, having died, I will appoint Dr. Herman Reineking, of Sheboygan, to serve as Censor in his place.

We will now proceed to the program so as to lose no time.

Dr. Kaumheimer, of Milwaukee, Chairman of Committee on Materia Medica, then read a paper entitled, "Shall the Manufacturer do Our Prescribing?" The paper was referred to Committee on Publication.

Dr. Feld, of Watertown, next read a paper on the subject of "The Treatment of Chlorosis." After discussion the paper was referred to Committee on Publication.

Dr. Hill, of Milwaukee, then presented a paper on "Oxygen as a Therapeutic Agent." Paper referred.

Dr. Madden, of Milwaukee, then presented an address upon the "Effects of Stimulating Narcotics, a Social Question." Paper referred.

Dr. Burgess: I desire to offer the following amendment to the By-Laws:

In 1892 the following By-Law was adopted:

"*First.* That at the annual meeting a dinner shall be provided at the expense of the Society, under the direction of an Anniversary Chairman, and a committee appointed for that purpose.

"*Second.* An invitation to the dinner may be given to such strangers, professional or otherwise, as the President of the Society or Anniversary Chairman shall think proper to notice in this manner."

I wish now to offer an amendment by adding another section to this article as follows:

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"That a roll of honor consisting of a list of all deceased members of the Society shall be called by the Anniversary Chairman, at every annual banquet immediately after the prayer, all the members standing."

The President: At the close of the morning session tomorrow this amendment to the By-Laws will come up for action.

Dr. Bartlett: We find on meeting this morning that there has passed away one of the familiar figures of our Society, a gentleman who has borne the work of this Society and done honor to it, a man who has read papers here and always been ready to do his duty. I refer to the late Dr. William Meacher, of Portage. He was a member of the Board of Censors, and in his absence I would like to nominate Dr. Herman Reineking, of Sheboygan, to serve in his place.

The President: I have already named Dr. Reineking.

The Board of Censors here made a report, and the names of applicants for admission to the Society were ordered posted according to the rule. (For list of new members reported at this time and subsequently, see end of these minutes.)

On motion the Society adjourned till 2:00 o'clock P. M.

May 4, 1898, 2:00 o'clock P. M. Proceedings resumed. Society called to order by the President.

Dr. Sifton, of Milwaukee, Chairman of the Section on Surgery, then read an address on "Osteomyelitis." After discussion the paper was referred to Committee on Publication.

Dr. O'Keef, of Menominee, Mich., then read a paper on the subject of "Report of Case of Recurring Multiple Sarcoma Cured by Contracting Erysipelas." Paper referred.

Dr. Levings, of Milwaukee, then read a paper on "Surgical Shock." Paper discussed and referred.

Dr. Batchelor, of Milwaukee, then read a paper on "Fractures about the Elbow." Paper discussed and referred.

Dr. T. C. Malone, of Milwaukee, next read a paper on

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"The General Practitioner and the Surgeon, from the Standpoint of the General Practitioner." Paper referred.

Dr. Reineking, of Sheboygan, then read a paper on the subject of "A Supplementary Report on a Case of Traumatic Epilepsy Treated by Craniectomy." Paper discussed and referred.

Dr. Mereness, of Milwaukee, then read a paper on "Cystic Kidney, with exhibition of specimen;" also, "Anomaly of the Vertebræ, with specimen." Paper referred.

Dr. Heidner, of West Bend, then read a paper on "Medical Treatment of Varicose Ulcers of the Leg." Paper discussed and referred.

Dr. Shimonek, of Milwaukee, then presented a report of cases as follows:

a. "Obstruction of the Common Bile Duct or Hepatic Duct."

b. "Forty Gall-stones Removed from the Cystic Duct with Subsequent Partial Stricture of the Duct."

c. "One Gall-stone of 2^{cc} Diameter Removed from the Duodenal End of the Common Duct."

d. "Two Hundred and Eighty Gall-stones Removed from the Gall-bladder with Perforation of the Gall-bladder and Colon."

e. "Laceration of Middle Meningeal Artery with Exhibition of Specimen." Paper referred.

Dr. Valentine, of Western Union, then read a paper on "The Operative Treatment of Hemorrhoids." Paper referred.

Dr. Kletzsch, of Milwaukee, then read a paper on "The Pathology of the Endometrium." Paper referred.

Dr. Burgess, of Milwaukee, Chairman of the Section on Pathology, then gave an address on "The Function of Pathological Anatomy."

The meeting then adjourned until Thursday, May 5, 1898, at 9:00 o'clock A. M.

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May 5, 1898, 9:00 o'clock A. M. Session resumed. Society called to order by the President.

Dr. Sarles, of Sparta, Chairman of the Committee on Practice of Medicine, then read an address on "The Country Doctor in the Practice of Medicine." Paper referred.

Dr. C. M. Beebe, of Sparta, next read a paper on "Epidemic Catarrhal Jaundice, with report of case of Acute Yellow Atrophy of Liver." Paper referred.

Dr. Washburn, of Milwaukee, then read a paper on "Infectious Jaundice." Paper discussed and referred.

Dr. Comfort, National Home, then read a paper on "The Diseases of the Climacteric Period, Advanced Life and Old Age." Paper referred.

Dr. Comfort also presented to the Society for its examination, two X-Ray pictures of multiple arthritis deformans.

Dr. Mills, of Janesville, next read a paper on the subject of "Brain Tire." Paper referred.

Dr. Patek, of Milwaukee, then read a paper on "Atony of the Stomach." Paper referred.

Dr. Elmergreen, of Milwaukee, next read a paper on "Delirium Tremens in Moderate Consumers of Alcoholic Beverages; with Report of Four Cases." Paper referred.

Dr. Seaman here took the chair.

Dr. Hirth, of Milwaukee, then read a paper on "Three Cases of Toxic Hemoglobinuria; Two Deaths and One Recovery." Paper discussed and referred.

Dr. Helm, of Beloit, read a paper on "The Passing of the Family Physician." Paper referred.

Dr. Sauer, of Racine, read a paper on "Gastrosuccorrhea or Gastroxynsis." Paper referred.

Dr. Lyman, of Mendota, Chairman of the Section on Neurology, then presented an address on "The Relation of So-called Nervous Diseases to Mental Alienation." Paper discussed and referred.

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Dr. Buckmaster, of Lake Geneva, read a paper on "Paretic Dementia." Paper referred.

Dr. Wingate, of Milwaukee, read a paper on "The Etiology, Prevalence and Treatment of Hysteria." Paper referred.

The Society then adjourned to 2:00 o'clock P. M., the program then to be taken up where now left off.

May 5, 1898, 2:00 o'clock P. M. Session resumed.

Dr. Burgess: I gave notice yesterday that I would move the adoption of an amendment to the By-Laws to-day, being Article VII of the By-Laws, by adding a third section, to-wit:

"That a roll of honor consisting of all deceased members of the Society shall be called by the Anniversary Chairman at every annual banquet, immediately after the opening prayer, all the members standing."

Motion to adopt was then made and seconded.

Dr. Burgess: I simply want to state my reasons for making this motion. It has seemed to me for several years, that we have paid too little attention to the passing of members of our Society, many of them distinguished men, and that inasmuch as the life and reputation of a physician are ephemeral, that it will do us no harm to commemorate the memory of the dead as long as we can. It will do us no harm to hear occasionally such names as Ira Manley, Henry Palmer, and William Meacher, and the names of many other distinguished members of the Society, and that is the reason I have made this motion.

Motion unanimously carried.

Dr. Gasser, of Platteville, read a paper on "The Circulation of the Nervous System." Paper referred.

Dr. Lyman: I want to suggest to the Society that we feel that we of the Neurological Section are perhaps intruding on your time, and we would ask permission to withdraw to room 540 to complete our work.

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The Secretary: We all regret that we can not hear these very interesting papers, but our plan has been to begin with the papers of the program regularly belonging to the session, which would be the first papers on the program of Thursday afternoon.

A motion was then carried to grant Dr. Lyman's request, and to allow the Neurological Section to withdraw, and that the rest of the papers under that section be read before the Section on Neurology, in room 540.

Room 540, Section on Neurology.

Dr. Herman Gasser, of Platteville, completed the reading of his paper. Paper referred.

Dr. Friend, of Milwaukee, read a paper on "A Case of Amyotrophic Lateral Sclerosis with Degeneration in Goll's Columns and in the Medulla Oblongata." Paper discussed and referred.

Dr. White, of Wauwatosa, then presented a paper on "The Importance of Early Treatment in Insanity." Paper discussed and referred.

Dr. Wegge, of Oshkosh, then presented a paper on "Cerebral Syphilis." Paper referred.

Dr. Becker, of Milwaukee, read a paper on "Evolution of Persecutory Ideas." Paper discussed and referred.

Dr. Oviatt, of Oshkosh, at the regular general session (Section of Gynecology), read a paper on "Uterine Myofibromata." Paper referred.

Dr. Burgess: I think we are losing a good deal of time in not hearing any discussion on these papers. I now move that we discuss every paper as it is read.

Motion carried.

Dr. Robinson, of Chicago, then spoke on the subject of "The Structures involved in Perineorrhaphy." Paper discussed and referred.

Dr. Shimonek, of Milwaukee, read a paper on "The Value of Ligation *en masse* of the Broad Ligaments in Removal

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of Ovaries and Tubes, with Demonstration of Figure of Eight Ligature." Paper referred.

Dr. N. M. Dodson, of Berlin, Chairman of Committee on Obstetrics, then read a paper on "The Country Obstetrician, his Duties; How to Avoid and How to Treat Obstetrical Septicemia." Paper referred.

Dr. Caldwell, of Waukesha, read a paper on "The Care of Cases of Abortion." Paper referred.

Dr. Hewitt, of Milwaukee, read a paper on "Eclampsia as an Indication for the Induction of Premature Labor and the Best Method of Performing the same." Paper referred.

Dr. J. T. Scollard, of Milwaukee, read a paper on "The Inversion of the Uterus." Paper referred.

Dr. Garlock here took the chair.

Dr. J. J. McGovern read a paper on "Puerperal Infection, Cause, Symptoms, and Treatment." Paper discussed and referred.

Dr. W. C. Bennett, of Milwaukee, read a paper on "Milk and Infant Feeding." Paper referred.

The Society then adjourned to meet May 6, 1898, at 8:30 o'clock A. M.

May 6, 1898, 9:00 o'clock A. M. Session resumed. Society called to order by the President.

Dr. Seaman, of Milwaukee, Chairman of the Section on Ophthalmology and Otology then read a paper on "Opticians and Spectacle Peddlers." Paper referred.

Dr. Würdemann, of Milwaukee, then read a paper on "Operative Treatment of Pharyngeal Adenoids." Paper discussed and referred.

Dr. Würdemann then read a paper on "Macroscopic Specimens of Eye-Sections." Paper discussed and referred.

Dr. Bartlett, of Milwaukee, then read a paper on "The Extraction of Foreign Bodies in the Ear."

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Dr. Bach, of Milwaukee, read a paper on "The Present Status of the Use of Antiseptics in the Surgery of the Eye." Paper discussed and referred.

Dr. Zimmermann, of Milwaukee, read a paper on "Eye Affections in Puerperal Eclampsia." Paper discussed and referred.

Dr. J. Steele Barnes, of Milwaukee, then presented Reports of Cases as follows:

a. "Congenital Opacity of Cornea."

b. "Bilateral Congenital Fistula of Lachrymal Sac."

c. "Gumma of Inferior Turbinated Body."

Report discussed and referred.

Dr. Hitz, of Milwaukee, Chairman of the Section on Laryngology, then read a paper on "The Value of Discussion in Medical Societies." Paper discussed and referred.

Dr. Rogers, of Milwaukee, read a paper on "The Prevention of Nasal Catarrh." Paper discussed and referred.

Dr. Thorne, of Janesville, read a paper on "Asthma." Paper discussed and referred.

Dr. Conkey, of West Superior, read a paper on "The Influences of Gastric Disturbances upon Catarrhal Disease of the Nose and Post-nasal Space."

The Society then adjourned to meet at 2:00 o'clock P. M., to continue the program, beginning with the subject of State Medicine and Hygiene.

May 6, 1898, 2:00 o'clock P. M. Session continued. Society called to order by the President.

Dr. Marquardt, of La Crosse, read a paper on "How to Prevent the Spread of Infectious Diseases in our Dwellings." Paper discussed and referred.

Dr. Fuchs, of Loyal, read a paper on "Vital Statistics and Health Laws." Paper discussed and referred.

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Dr. Becker, of Milwaukee, Chairman of the Medico-legal Section, read a paper on "Criminal Responsibility." Paper discussed and referred.

The Secretary: I desire to read the following papers by title, to be referred to the Publication Committee:

"Diet as a Therapeutic Agent," by Dr. Karl Kordenat, Reedsburg.

"Intestinal Obstruction," by Dr. G. D. Ladd, Milwaukee.

"The X-Ray in Fractures," by Dr. Ralph Chandler, Milwaukee.

"Some Remarks Concerning Suitable Treatment, Before, During, and After Surgical Operations," by Dr. J. A. Jackson, Madison.

"Some of My Experiences in Abdominal Surgery," by Dr. Jno. Specht, West Superior.

"Tuberculosis of the Genito-urinary Organs," by Dr. J. R. McDill, Milwaukee.

"The Physiological Action of Bacteria, and their Relation to the Maintenance of Life," by Dr. V. A. Gudex, Milwaukee.

"Carbonic Oxide Poisoning," by Dr. J. R. Barnett, Neenah.

"Immediate Repair of the Perineum," by Dr. G. V. Mears, Fond du Lac.

"Metro-Endometritis," by Dr. W. E. Ground, West Superior.

"The Midwifery Question," by Dr. J. Noer, Stoughton.

"Address of Chairman of the Section on Pediatrics: The Etiology and Treatment of the Diarrheal Diseases of Infancy," by Dr. L. Boorse, Milwaukee.

"Infantile Scurvy, with Report of a Case," by Dr. J. F. Pember, Janesville.

"Infant Feeding," by Dr. A. W. Kratzsch, Milwaukee.

"Influenza in Children," by Dr. Wm. Sweemer, Milwaukee.

"Mydriatics and Myotics in General Practice," by Dr. J. A. L. Bradfield, La Crosse.

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"Some Cases Bearing on the Peripheral Causation of Epilepsy," by Dr. F. H. Edsall, Madison.

"The Air We Breathe," by Dr. F. T. Nye, Milwaukee.

"Life Insurance," by Dr. M. H. Clark, Milwaukee.

On motion it was voted that the papers read by title, be referred to the Publication Committee.

A motion was made and carried that the minutes of the preceding session of this Society be accepted and adopted as printed, and that the reading be waived.

The Secretary: I would like to announce that the meeting of the American Medical Association will be held June 7th, 8th, 9th, and 10th in Denver, Colorado, and any who wish to go from this Society as delegates will be given certificates.

A communication from the Rhode Island State Medical Society on the subject of Criminal Abortion was then read.

A communication regarding a fund for the erection of a monument to Dr. Rush, stating that the fund was far from sufficient, was then read.

The President: I would like to hear from the Monument Committee, Dr. Wingate, chairman.

Dr. Wingate: I have not heard from the members of my committee yet. So far I have collected about $60 which is all ready to be turned over, but I would like to hear from the other members of the committee before doing so.

The President: One hundred dollars was the amount that was asked for, was it not?

Dr. Wingate: Yes.

The President: I hope the members will make up that amount before they leave.

The Secretary: I wish to propose an amendment to Article II of the Constitution, which reads as follows:

"The Society shall meet annually, on the first Wednesday of May or June, as may be directed by the Secretary, at 8:00 o'clock P. M., in the place designated by the Society at its previous meeting."

I wish to amend this as follows: In place of Article II I would read:

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"The Society shall meet annually on the third Wednesday in June, at 11:00 o'clock A. M., in the place designated by the Society at its previous meeting."

This can be acted upon by unanimous consent only, of course, at this time, and I would like such action.

Heretofore the plan has been as follows: The meetings of the American Medical Society are held either upon the first Tuesday in May, or the first Tuesday in June, according to the section of country where the meeting is to be held, it being held in May when south, and in June when north, and it has been the custom to hold a meeting of the State Society at the time when the American Association is not held, when the national meeting is held in May we hold ours in June, and *vice versa.* Accordingly there has always been an indefiniteness as to the time of the meeting. We do not know to-day when we shall meet next year, because it will depend upon the time and place of the meeting of the American Medical Association, which will be determined at Denver next month.

Moreover, as it turns out, we more frequently meet the first Wednesday in May, when, in this climate, the weather is usually cold and disagreeable.

Furthermore, there is usually much more sickness the first part of May than in June, and I know from my own personal experience that we have had to sacrifice a great deal more in the way of leaving our business, if that is to be a thing to be considered, than we would if we held our meetings on the third Wednesday in June, which is probably the healthiest time of the year.

The points then in favor of a change are these: that the season is more pleasant and agreeable, that we have to sacrifice less business, that the date is fixed and permanent, and we all know at all times the date of our meeting. It is a matter which I have suggested for several years in my report. It has never been acted upon, but I can see no reason why it would not be an excellent plan to adopt this amendment at this time.

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Dr. Fuchs: I move you that we proceed to the immediate consideration of the amendment.

The motion was put, but the vote not being unanimous the consideration of the amendment was postponed for one year.

The Secretary: Another amendment to the Constitution has been proposed to Article X by Dr. Seaman.

Dr. Seaman: This will have to take the same course, unless the unanimous consent can be had to its consideration. Article X of the Constitution reads as follows:

"Any regular physician making application for membership in accordance with the provisions of Article IX, and who shall present a diploma from a regular school of medicine of good repute, or certified diploma of membership in a county or district medical society, accompanied by a certificate of six years' practice, or who shall submit to such an examination as the Censors may impose, shall, on their recommendation and on their receiving a vote of two-thirds of the members present at an annual meeting, be entitled to membership by signing the Constitution and paying five ($5.00) dollars to the Treasurer of the Society, which sum shall include his annual dues for one year."

I desire to add the following to this article:

"Provided, however, that those graduates whose diplomas are dated subsequent to July 1, 1897, shall also present the certificate of the Wisconsin State Board of Medical Examiners."

Dr. Friend moved that the Society act upon this amendment by unanimous consent.

Dr. Seaman: That is simply a proposition to have the members who graduated subsequent to July 1, 1897, present with their diplomas, to the Board of Censors, a license from the State Medical Examiners.

Dr. Robinson: What about the six years' practice?

The President: It does not apply to that, it does not alter any other portion of Article X. The six years refers to those who have no diploma. It is in addition to that.

The question being put the vote was not unanimous, and the amendment was laid over for one year.

The Secretary's report was then read.

In the course of the report the Secretary said: I wish to

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state that our increase this year in membership is 74, which brings our number up already to 550. This is the largest nnmber of new members that we have ever received at any one session.

SECRETARY'S REPORT FOR 1898.

The Secretary begs leave to submit the following report for the past year:

MEMBERSHIP.

The membership as shown in the Transactions of 1896 was 453, that of last year is 484—a net gain of 31 members, accounted for as follows:

Number of new members received at last meeting		48
From which are to be deducted:		
Died during the year	4	
Resigned	1	
Transferred to honorary list	1	
Dropped for non-payment of dues	11	
Making a total loss of		17
Which deducted from number of new members makes a net gain of		31

The number of members in the Transactions of 1891—six years previous, was 303. This shows an average gain of over 30 for the six years. At this rate of increase we should number 514 next year, and about 550 the year following. Numbers are not necessarily an index of progress or efficiency, but they certainly are a pretty safe indication of the interest felt in the Society by the profession of the State. The members are again urged to make a canvass of the physicians in their locality, and bring to the meeting the applications of those who cannot attend in person. We have now in our Society about one-third of the regular profession of the State—the whole number in Polk's Directory being between 1,400 and 1,500.

The removals since the last meeting have been as follows: Dr. F. W. Adamson, from Milwaukee to Ridgeway; Dr. M. D. Bird, from Oconomowoc to Marinette; Dr. S. B. Bush-

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nell, from Hurley to Cleveland, Ohio; Dr. C. A. A. Brück, from Wauwatosa to Milwaukee; Dr. R. W. Earl, from Columbus to Milwaukee; Dr. V. M. French, from Mendota to La Crosse; Dr. W. C. Hanson, from Milwaukee to Beaver Dam; Dr. C. F. Hess, from Johnson's Creek to Reeseville; Dr. A. J. Hosmer, from Ashland to Salt Lake City; Dr. Eugene Le Sage, from Colby to Medford; Drs. Stella B. and Thomas R. Jones, from Eldorado to Oshkosh; Dr. J. C. H. Lawrence, from Oconto to place unknown; Dr. S. R. Moyer, from Milwaukee to Monroe; Dr. E. J. Orvis, from Campbellsport to Milwaukee; Dr. Wm. E. Owen, from Fox Lake to Williamsburg, Iowa; Dr. A. J. Rosenberry, from Wausau to Oak Park, Ill.; Dr. F. R. Salisbury, from Oregon to Sparta; Dr. H. J. Stalker, from Mauston to Randolph; Dr. D. R. Stockley, from Lake Geneva to Evanston, Ill.; Dr. F. R. Zeit, from Medford to Chicago, Ill ; Dr. James Monroe, from Markesan to Idaho; Dr. W. B. Monroe, from Brooklyn to Monroe.

Two deaths have been reported: Dr. L. M. Squire, of Poynette, and very recently Dr. Wm. Meacher, of Portage, one of the Censors of this Society, and who has been a member twenty-nine years, having joined our ranks in 1869.

If there are any omissions, it is hoped that the members present will assist in making the record as complete as possible.

PUBLICATION.

The Transactions of 1897 contain 679 pages, which is 73 pages more than the '96 volume, or that of any previous year. While such a large amount of printed matter may indicate activity and interest, and while the average merit of the papers is good, it would seem preferable to print a smaller volume and to secure, if possible, a higher standard of excellence in the papers published. Moreover, the expense in publishing so large a volume is very much increased and bears heavily on the finances of the Society. To be sure the Soci-

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ety might direct the Publication Committee to discriminate, and to print only what they think are the best of the papers, but it is very probable that the Committee might be lacking in the moral courage necessary to carry out the order. This year's program contains ninety-three papers—one less than last year. If the papers are of the same average length, and we print them all, as usual, the size of the '98 volume will be about the same as that of '97. The contract for printing was given to Messrs. Tracy, Gibbs & Co., of Madison, who have done the work for several years very satisfactorily. Six hundred and twenty-five copies were printed and distributed to the members, the affiliated State and National societies and various libraries—the whole edition bound in cloth. The expense of publication was $758.60—an average of $1.21 per copy. This compares very favorably with the experience of other State societies, as does also the appearance and make-up of the volume.

PROGRAM.

The Program Committee, under the efficient leadership of Dr. Ralph Chandler, Chairman, has had entire charge of the preparation of the program. That their labors have been energetic and pains-taking is abundantly testified in the admirable program placed before us. It may be that the feast is richer and more abundant than can be well digested in the short time at our disposal, and the Secretary would suggest that hereafter a limit be placed to the number of papers which shall be accepted in the various sections. Our sessions should not be hurried and adequate time should be reserved for thorough and deliberate discussion.

The usual means have been employed in the preparation for the meeting. A postal was sent to the members of the Society about March 1st, announcing date and place of meeting. About the last of March the "Announcement and Invitation" was sent to all the regular profession of the State, some 1,400 in all. The provisional program, with a blank application en-

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closed, was also sent to the whole regular profession about the middle of April, while the regular program was sent only to the members about one week before the meeting.

By these means the meeting has been widely advertised and the whole profession has been made acquainted with the work and scope of the Society.

It will be noted that the Committee of Arrangements, in the generosity of their hearts, and on the principle that "all work and no play makes Jack a dull boy," have this year given us two whole evenings for just simply a good time and a chance to become better acquainted. The motive is most praiseworthy and the principle on the whole sound. It may be well, however, for the Society to express its sentiments on the matter as a guide for the future. Under any circumstances it is entirely true that our social, as well as our scientific instincts should receive proportionate recognition.

The State Board of Medical Examiners has now been in existence nearly a year. As a child of the Society we are vitally interested in all its experiences. It is fitting that we hear from members of the Board what are the modifications or additions which, in their judgment, the law requires, that we may plan wisely to secure in the future such changes as shall make the law more in accordance with our wishes.

For reasons given before, the Secretary would again suggest that the third or fourth Wednesday in June be selected as the fixed and permanent date of our meeting. There are many arguments in its favor and none in opposition that are apparent.

In conclusion, we may again congratulate ourselves upon the continued prosperity and growth which have been the lot of the Wisconsin State Medical Society for another year of its history. Entire harmony of feeling and cordial cooperation in the work have been its characteristics this year as in the past.

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With such conditions as our permanent possession, we can not but go on conquering and to conquer till we, whose right it is, shall reign in the affections of every good doctor in the length and breadth of Wisconsin. In behalf of the officers of the Society, heartily thanking all who have contributed to the success of this meeting, this report is

Respectfully submitted,

CHARLES S. SHELDON, *Secretary.*

On motion the report was adopted.

The Treasurer's report was then presented.

Dr. Hall: Before reading my report I would like to make a correction in the Transactions of last year, where on account of a momentary aberration of intellect I reported that the Treasurer's salary had not been paid. At the same time I offer an apology to Dr. Sheldon, since he is the only officer of the Society who receives a salary. The report intended to say that Dr. Sheldon's salary had not been paid.

The Treasurer submits the following report:

TREASURER'S REPORT.

MILWAUKEE, May 6, 1898.

S. S. HALL, *Treasurer*, in account with the State Medical Society of Wisconsin:

DEBTOR.

Cash of hand at last report, May 7, 1897		$548 38
Received for annual dues	$1,271 00	
" " assessments	440 50	
" " admission fees	450 00	
		$2,161 50
Total		$2,709 88

CREDIT.

Paid for banquet of 1897	$79 25
Dr. F. A. Brodsky, for expense of Committee of Arrangements	2 15
Tracy, Gibbs & Co. (note account 1896-7)	591 48
P. F. Pettibone & Co., Chicago, 500 diplomas	17 00
Dr. C. S. Sheldon, Secretary, expense	61 36

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Dr. C. S. Sheldon, Secretary, salary 1896–7	200 00	
Tracy, Gibbs & Co., printing	66 40	
Burdick, Armitage & Allen, printing	4 50	
H. D. Goodwin, stenographer	104 80	
Lightning Messenger and Express Company, delivery Transactions	5 65	
Dr. C. S. Sheldon, Secretary, expense	76 45	
Dr. W. F. Becker, account of Committee on Law for Insane	93 21	
Dr. G. E. Seaman, Sec. Com. on Medical Legislation	180 00	
Tracy, Gibbs & Co., on note account of 1897	50 00	
West. Pass. Asso., for attendance two days annual meeting, 1898	12 00	
C. H. Ellsworth & Co., printing	2 75	
C. H. Ellsworth & Co., printing	3 75	
Postage, stationery and exchange, Treasurer	29 80	
Total		$1,580 55
Balance on hand		$1,129 33
Total		$2,709 88

S. S. HALL, *Treasurer.*

On motion the report of the Treasurer was referred to the Finance Committee.

The Finance Committee then presented its report as follows:

REPORT OF FINANCE COMMITTEE.

MILWAUKEE, May 6, 1898.

We, the undersigned Finance Committee, have examined the Treasurer's accounts and vouchers and find them correct as per report submitted.

F. E. WALBRIDGE,
J. STEELE BARNES,
ARTHUR J. PATEK,
Finance Committee.

Finance Committee's report received and placed on file.

The President: The Committee on Temporary Headquarters for the Insane, Dr. Ladd, chairman, may report.

Dr. Seaman: In the absence of Dr. Ladd, I simply want to say that we have held several meetings during the year, and that we have set going an agitation looking towards the establishment of a detention ward in the Emergency Hospital

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in this city, and everything looks favorable. I am sorry Dr. Ladd is not here to make an extended report.

Dr. Tanner: On behalf of the Fox River Valley Medical Society, I invite the State Society to meet at Oshkosh next year. I think it has been a dozen or more years since the Society met there, and there can be no trouble about having fun with the boys there.

Seconded.

Dr. Mereness: Of course it is always understood that Milwaukee expects the Medical Society to meet here, and extends a warm and cordial invitation for the Society to come here on all occasions, and I do not like to see this time go by without renewing the invitation once more.

Seconded.

Dr. Hitz: I move that the invitation of Dr. Tanner, that the Society go to Oshkosh for its next annual meeting, be accepted.

Seconded.

Dr. Robinson: I have no interest in the remarks that I make, except for the Society. I have been in this Society since 1885, and we cannot get the meetings at other cities that we can here, for the simple reason that the railway facilities of course, are greater in Milwaukee than they are at Oshkosh, and I cannot get away and get to the place. Now, these are scientific meetings, and certainly we should not try to deprive the meeting of all the members that we have here at this time, by simply meeting in some town where the railway facilities are so far less than they are here, that many will be prevented from attending the meetings. Hence, a scientific body should meet where the facilities to get there are good, and where members can readily be induced to come. We have never had such a meeting as this in point of numbers before, and we want large numbers in attendance. Some of us are pretty busy — of course some of us are not — but those of us that are busy have but a limited amount of time, and must get away from the meetings as soon as possible.

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Dr. Seaman: I would like to say on behalf of a number of gentlemen in Milwaukee with whom I have spoken on this subject, that we are always glad to have the Society come to Milwaukee. Everybody knows that — everybody who has ever attended a meeting of the Society in Milwaukee — and I believe that every medical man in Wisconsin is very glad to come here at times. We want them to come here as often as we can get them to, but once in a while we would like to get away from home ourselves, and go to Oshkosh, or somewhere else and have some fun with the boys, and if we have the meeting of the Society here in Milwaukee, it is hard to get away from our business. It is only ninety miles further from Chicago than Milwaukee, so Dr. Robinson will probably be able to get there, and we will have the pleasure of seeing him. I am in favor of getting away from home once in a while, therefore, I hope that we will accept the invitation that Dr. Tanner has so kindly extended to us to go to Oshkosh for our next meeting.

Dr. Reineking: So far as the welfare of the Society is concerned, the last two meetings of the Society have been held in the southeastern part of the State. We have taken in a great many members from this portion of the State; so we did in Superior. Now if we meet in the center of the State we will get a great many new members from that section, and from the northern part of the state, who find it difficult to come to Milwaukee and Racine.

A *viva voce* vote was then taken, and thereafter a division of the house was called for.

A division was then made, and it was found that Oshkosh had received the greater number of votes, and therefore the invitation to meet at Oshkosh next year, was accepted.

Dr. F. E. Walbridge: In accordance with the Secretary's report which I think is in accordance with the sentiments of the Society, I want to offer some resolutions with reference to the number of papers and the program:

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"*Resolved*, That it is the sense of the members of the Wisconsin State Medical Society, that the scientific program be restricted to a number of papers not to exceed fifty for any one meeting; that the program committee be instructed hereafter to accept not more than fifty papers for any one meeting of the Society, one-half to be read by invitation, and one-half by volunteers; that the officers of each section are hereby directed to invite members of the Society to contribute papers to be known as papers by invitation, the titles of which are to be submitted according to previous usage, but which may or may not be submitted for approval by direction of the Program Committee before the date of the meeting; and other papers to be known as volunteer papers, which may be offered by any member of the Society; that the Program Committee is hereby directed to receive these volunteer papers, which are to be in the hands of the Program Committee four weeks before the meeting, to be examined by the Program Committee, and to be accepted or rejected according to their merits; that the officers of the sections are directed to appoint one or more members to open discussions on each paper; that the number of papers be apportioned as follows: To the Committee of Surgery 8 papers—these are to be half by invitation and half by volunteers—Practice 8, Gynecology 4, Obstetrics 4, Neurology 4, Opthalmology and Otology 6, Laryngology and Rhinology 4, Pediatrics 4, Materia Medica and Therapeutics 2, State Medicine 2, Pathology 2, Legal Medicine 2, making a total of 50 papers."

Dr. Phillips: I move the adoption of the resolution as read.

Seconded.

Dr. Robinson: I would like to make an amendment that a cipher be given in the sending in of these papers, so that the Committee will not know who wrote them—a motto—because then the Committee can have a stiff backbone.

Seconded.

Dr. Levings: The provision that the papers shall be in the hands of the Committee one month before the time of the meeting, might work a hardship to a good many. I never have my paper finished before the day of the meeting, and I was asked to send in a synopsis of my paper a month before this meeting took place, and I did so, but it is a little difficult to send a synopsis of a paper that you have not even thought about, and I think many might find it a hardship to send papers in a month before the meeting, unless they were given very ample time for preparation beforehand.

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Dr. Seaman: I would like to make a suggestion. I believe we are all in favor of the subject of this resolution, but perhaps it would be better to refer this matter to the officers of the Society when they are getting up the program and have it arranged accordingly.

Dr. Fuchs: I suggested to Dr. Würdemann a proceeding which I believe the British Medical Society is about to adopt or has adopted. The objection just made by my colleague (Dr. Levings) does not hold. A man can just as well prepare his paper six months or four weeks ahead of time, as just on time. The suggestion would be this, that all papers shall be prepared and handed to the Committee, let us say, two or three months beforehand, and that those papers which are thought to be fit, shall then immediately be proofed, and as many reprints made as the writer desires, and the reprints distributed to the men who wish to engage in the discussion. A man can get up a library paper mighty handily and swamp the whole society. In a general way I think I can discuss a general paper, but not a special paper.

Dr. Currens: My idea of this matter is, to limit the number of papers to fifty and leave it in the hands of the Committee.

Dr. Reineking: Whatever plan we may adopt will work some hardship, but that we must adopt some plan to limit the number of papers, is absolutely necessary, and the time must be fixed by which they must be in. If they are to be looked through by the Committee, and the program then printed in time, they must be in at least four weeks before the meeting. Many of us can work fast under pressure, and I myself generally defer the writing of my paper until the last few days before the Society meets, because I can work better when I know it has got to be done; but as I said before, something must be done to limit the number of papers, and I believe that; taking it altogether, this plan is a good one.

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Dr. J. Steele Barnes: I think the idea of this resolution was simply to adopt something whereby we can get more discussion. I fail to see, even if you limit the number of your papers, and do not limit the time of your papers, how you are going to get any more time for discussion. We have oftentimes papers that are very lengthy, and if you have lengthy papers you cannot have discussion. It is not the papers that we want—we can read them in the report—we do not need to pay railroad fare to listen to some one read a paper. It is the ideas of the other members that we want. We want discussion, we want a short pithy paper that will bring forth some points for discussion, and then get the ideas of the men present on it. I believe if we can have a resolution adopted whereby we can have eight or ten minute papers, we will get more discussion, and you do not need to limit the number of your papers. I believe an amendment to limit the time and not the papers would be better.

Dr. Seaman: Not to prolong this discussion, I simply want to say that I believe the Society has confidence in its officers, and I believe the Program Committee will be thoroughly capable of taking care of this matter. I believe the Society is thoroughly in accord with the spirit of these resolutions and I would ask these gentlemen who have made the motions bearing upon the resolutions, to withdraw their amendments and simply allow this matter to be referred to the proper officers with instructions to take care of it and act as they see fit.

Dr. Robinson: With that understanding and with the consent of the second I withdraw my amendment.

Amendment withdrawn.

The President: The question is before the house, whether those resolutions to be carried out will be entrusted to the future officers of the Society.

Motion carried.

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Dr. Mereness: I desire to move the following resolution, not because I have any lack of confidence in the gentlemen who shall be elected as officers of this Society, but because I want to let them out of a tight place easily. I move that it is the sense of this Society expressed here in this meeting, that all volunteer papers shall be designated to the Committee not by name but by number, letter or monogram. This is simply expressing the sense of the meeting to the Committee.

Motion carried.

Dr. Würdemann: Our Transactions and papers are of sufficient value so that outside people, editors of journals, etc., are very glad to get them, and I think it would be advisable to adopt the following resolution:

"*Resolved,* That the Secretary be authorized to allow of extracts or abstracts being made, at his discretion, of papers and discussions read before this Society and intended for publication."

Dr. Burgess: Does the mover of the motion mean that all the editors in the country shall be permitted to make extracts, or that the writer shall make them?

Dr. Würdemann: The resolution was not drawn by me, but I take it to mean that at the Secretary's discretion, extracts or abstracts of our scientific proceedings may be made and allowed to be published elsewhere, *e. g.*, in the *Journal of the American Medical Association*, or the *Medical Record*, etc.

Dr. Reineking: At the meeting in West Superior a resolution was passed to this effect, that the papers read before the Society are the exclusive property of the Society, and if published previous to our transactions cannot be published in the Transactions. This resolution has never been regarded, because papers have been published in the journals before they were published in our Transactions. Every year, I get reprints before our Transactions are out. Perhaps it would be just as well, as long as the rule adopted

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at West Superior is a dead letter anyway, to pass this resolution, but I would suggest that it be left to the author of the paper to select the journal in which he wishes to have his paper published, and not force the Secretary to throw the papers entrusted to him open to everybody.

Dr. Seaman: I am decidedly opposed to these papers being published before they are published in our Transactions. They are contributed to the Society. Our Transactions are the proper place to have them first published, and if we have not a rule to that effect here, as Dr. Reineking says we have, I think we ought to have one. At least it ought to be in some way understood that these papers are not to be published until they are first published in our Transactions. If they are, our Transactions are practically valueless —nobody will want them—and we might better save the money which it costs to publish them.

Dr. Currens: Another dangerous feature is this: Every one of us receives about 150 a month of these little half-fledged, two-leafed pamphlets in the form of medical journals that take up special points of a good article to recommend some proprietary medicine. That is a dangerous thing to put on our records. The Society should have the first chance to bring articles to the public.

Dr. Earles: I move that all further consideration of this matter be indefinitely postponed.

Carried.

Dr. Robinson: There is a resolution handed to the Secretary in regard to the case of Dr. Simonson, which I would like to have brought up.

The Secretary: The resolution is as follows:

WHEREAS, Dr. J. Simonson, of Tomah, Wis., was duly elected May 5, 1897, a member of the State Medical Society of Wisconsin at the annual meeting of said Society held at Racine, Wis., therefore

Resolved, That the Secretary of said Society be, and hereby is instructed to place the name of said Dr. Simonson in the list of names of said Society.

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Dr. Robinson: I move that the records of this case be placed before a committee appointed by the President, which shall report to the Society.

Seconded.

The President: Dr. Robinson's motion is, shall these papers be referred to a committee to be appointed by the President to investigate, and that they shall report to the Society.

After discussion the motion prevailed.

Dr. Seaman: I have a series of resolutions which I desire to read and offer.

WHEREAS, The last legislature passed a law regulating the practice of medicine in the State of Wisconsin, and

WHEREAS, An excellent board of medical examiners was appointed by the Governor and commenced its labors about one year since, and

WHEREAS, The beneficial effects of the law are already apparent in the suppression of quackery, and enthusiasm for better medical education, THEREFORE

Resolved, That this Society again affirms its belief in medical legislation and that its members pledge themselves to assist in maintaining these laws already found so useful and necessary.

Resolved, Further, that this Society has entire confidence in the ability, integrity and judgment of the members of the Wisconsin Medical Board of Examiners.

Resolved, Further, that a committee on medical legislation, of five members, be appointed by the President, with power to increase this number or fill vacancies, to assist in maintaining the high standard of medical practice for which we have contended for the last twenty years.

I move the adoption of the resolutions.

Seconded. Motion carried.

The President: I will appoint as the committee asked for by Dr. Robinson, Dr. Ogden as chairman, Dr. Batchelor, and Dr. Sifton.

Dr. Fuchs: I move you the appointment of a committee to take steps towards the realization of the views I expressed in my paper, that is, a proper vital statistics law.

Seconded.

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Dr. Walbridge: As Dr. Sheldon has suggested in his report that perhaps it would be of some interest to the Society to know something of what the State Board of Medical Examiners have been doing, I have thought best to say a few words. As you all know, this is the first year of the existence of the board, and I might start out by saying that the number of licenses that have been granted by the board is somewhere about 160 or 170; the number of applications, that is applications for blanks on which no license has been given, is about 250 to 300. I mean by that that men outside of the State have written for the blanks and letters of instruction, to the number of about 250 to 300. After receiving the blanks, for some reason, whether they could not meet the requirements or other reasons, they did not put in their applications formally, so that we believe during the first year a great number of incompetent men have been kept out of the State. Of course we do not expect that all these 250 to 300 that asked for the law and for the application blanks, intended to come here, but undoubtedly a great number of them did. As you all know, the law also provides for examination in cases where no diploma is possessed. We have had, I believe, ten such examinations, and either two or three, I don't remember the exact number, passed the examination.

There have also come to us several applications accompanied with diplomas which we could not recognize.

The board has met with very many difficulties. As you all know, we have a law that was passed under a great many difficulties, and that it is imperfect. Our greatest trouble has been in interpreting this law, and I have come to the conclusion that doctors are not good interpreters of law. I have also come to the conclusion that very few lawyers know very much about interpreting law, and while it is a common thing that doctors disagree, I have come to the conclusion that we almost never disagree in comparison with the lawyers.

Dr. Phillips: It is their business to disagree.

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Dr. Walbridge: So far I believe the board has made no more mistakes than any other board of its kind for the first year. The only serious mistake, the only mistake that has worked any injustice in any way, I believe, has been in the matter of the Milwaukee Medical College. You have undoubtedly all known about this. Acting upon the advice of the Attorney General's office, we refused licenses to the graduates of 1898 of the Milwaukee Medical College. After a more thorough investigation and a conference with Attorney General Mylrea himself, and Mr. Charles Quarles of this city, the board concluded that they had misinterpreted the law, and have done everything that they could to make amends in this direction, and licenses have been granted, or will be, to the graduates of the class of 1898. This matter, I think, has been amicably settled between the Milwaukee Medical College and the Board of Medical Examiners.

Now, with reference to the amendments to our law, I do not think it is necessary to say anything here. There are quite a number of points that can be brought up, but as an arrangement has been made whereby there will be a Committee on Legislation, I think it is not proper to take up the time of the Society in talking about that matter now.

Dr. Earles: Mr. President, in connection with what Dr. Walbridge has said to you, I feel called upon to make a statement. It is perhaps unnecessary to refer to the controversy between the Milwaukee Medical College and the board, to any greater extent than to say this, that it appears that the faculty of the college and the board, although both being advised legally, had two separate and distinct opinions as to the interpretation of the law. The faculty, at the time that the board saw fit to refuse granting licenses to our graduates, felt that a great injustice had been done the school. This feeling I think was present in the minds of every member of the faculty, until the present session of the Society. During this time and after the final set-

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tlement of the affairs, further investigation has clearly demonstrated that the board has been acting in good faith.

In my own mind, and I think I speak for my associates in the college, there is no doubt now but that this board has been acting under the advice of the Attorney General's office, along the line they have adopted, and has been acting in good faith.

When this matter came to a final show-down, as it is sometimes termed, most of the members of the faculty, and myself in particular, I think, were acting under pretty high boiler pressure. A report appeared in the *Sentinel* in connection with it, for which I am responsible, and which I thought very just at that time, to the effect that it appeared from the very action of the board, that it was incompetent. In view of the more recent investigations and the action on the part of the board in acknowledging that they have made this mistake, and I believe they are now willing to do everything they can to repair it, we feel that there is an apology due them, and I here for myself, and so far as my associates are involved, wish to retract anything that we may have said in regard to the incompetency of the board, and to pledge that board anew, the same support that we have given them prior to this act.

The members of the Medical Board of Wisconsin never had warmer supporters than the members of the faculty of the Milwaukee Medical College. And I think I will say, in pledging our allegiance anew to this board, that they will not in the future have any men who will support them with more vigor in any honorable position they may take, than they will find among those who have fought them so strongly during the last three weeks. We felt that we were fighting for a principle and we fought strongly.

As far as the medical law is concerned, my experience has demonstrated to me very clearly that we have a rather weak law in some particulars, and it should be the duty of every practitioner in the state, to do what he can to bolster up those

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weak points until we have a law eminently satisfactory to everybody, and one that we can always stand by. For a great many years we have worked for this law. Now that we have it, let us try to strengthen it where it is weak, and do what we can to uphold the hands of the medical examiners in all efforts they may make in regard to the elevation of the standard of medical education in Wisconsin.

Dr. Currens: I am to be the begging member of the Board of Medical Examiners, and I want to present our case before this Society from a financial standpoint, and from a standpoint that will help this board to do the most efficient work possible. Our board is appointed under very peculiar restrictions. We are required, the same as the Dental Board and Board of Pharmacy, to carry on a warfare here against quacks, intruders and imposters, and are required to do this at our own expense, to the extent that we are not even allowed by the State of Wisconsin to have even one copy of the law, except it comes in the form of a law book, to distribute among our constituents. The fact of the matter is this: All the resources that this board has, come from the examinations it makes, and we have run way behind. Now the regular profession of this State all have a right to come and register under that law. There have been very few outside of the new men that have come into the State, that have registered, unless some member of the board has gone out personally and solicited them. Through my own solicitations, my county has responded quite liberally, but this board stands in just this position. We cannot do much until we get a registration, and I hope that the law will be amended so that everybody will have to have a license. Then this board will have something to work with. But at present it is very hard to follow the thing up. Then every man will have to be recorded and registered with the county clerk. Now the licenses we have granted number some 150 since the board was organized a year ago, and these licenses are from the new men that come

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in. It is to the advantage of this profession to register, because these licensed men go to the county clerk and are registered. I understand that the national war department is inquiring whether army surgeons here are members of the American Medical Association, or the State Medical Association. Now won't they inquire whether they are licensed or not? I am not pleading for $5 for my own sake, any more than to give the board a backing, and gentlemen, we will be glad to receive your applications any time.

Dr. Fuchs: I think we can get that in handily in any vital statistics law.

Dr. Mereness: I do not think that in view of this explanation we ought to wait until a law is passed compelling us to register, before we do so, and I want simply to say for one, that within the next ten days this board shall have presented to them my diploma, and an application will be made to them for a license for myself, from the board, to practice medicine in the State of Wisconsin.

Dr. Ogden: The Committee appointed to consider Dr. Simonson's case unanimously report that they are unable to determine the status of the case referred to them, as the evidence is too conflicting and the Committee wants more time.

Dr. Bartlett: I move that the Committee be granted one year's time.

Motion carried.

Dr. J. Noer: The statistics as presented would seem to indicate that physicians can usually and easily attend to the number of confinement cases that occur in their localities. This argument is very plausible and would appear to indicate that the midwife ought to be relegated to the rear as a relic of barbarism. A distinction must, however, be drawn here in the west, where the population, as in Wisconsin, is largely German and Scandinavian, and here the statistics as given by Dr. Garrigues will not hold true. The average German and Scandinavian family will be nearer eight than four. Let fam-

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ilies of this sort be located in rural communities where there are no free dispensaries and doctors are only to be had at a distance of from two to ten miles, and it will be seen that we have a condition of things entirely different from that which exists in the east.

We have here a condition of things in which the educated midwife is an aid, not only to the people, but to the physician also. The foreign population is, as a rule, in the habit of employing midwives, hence does not take kindly to the idea of being legally compelled to employ a physician.

While it is, as a rule, true that physicians are better qualified to conduct cases of labor, it is not so certain that recent graduates would be safer conductors for an ordinary case of labor than would be a midwife who has been trained only for her special work. We all know that the main thing to do in a normal labor is to see to it that the rules of asepsis are observed, and to support the patient with our courage and sympathy. A midwife who has had the benefit of theoretic and practical training in her specialty, which enables her to recognize malpositions and other serious complications, who is not legally permitted to use forceps or do any obstetric operation, is likely to call medical help in time of danger. Such a person is likely to be an aid in bringing about a rational and progressive spirit in the domain of obstetrics among the common people.

As it is, the ignorance, the superstition and the filth which prevail among a large class of the community are intensified by the filthy and ignorant midwives, who are the regular attendants of this class of people. While I recognize it as true that obstetrics is a department of medical science, fully as important as is gynecology, or, if you please, ophthalmology, yet I do not believe that our population is sufficiently enlightened on this subject to recognize this truth.

In order to obtain the opinion of the Society on the ques-

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tion, I wish to offer for your consideration the following resolution:

WHEREAS, Midwifery or obstetrics is an important branch of medical science and art;

WHEREAS, Midwives are not recognized by the State or in any way required to have any qualification for their important work, but are under present conditions, by reason of their ignorance and filth, a great danger to the life and health of the lying-in woman and her infant,

Resolved, That the State Medical Society strongly recommends the taking of immediate steps to secure the passage of a law requiring that all persons who are not legally qualified physicians, shall be licensed to practice obstetrics in this State only after passing an examination before the State Board of Medical Examiners; this examination to be reasonably elementary, but sufficiently comprehensive to indicate a fair practical and theoretic knowledge of the science and art of obstetrics.

I move that the President be empowered to appoint a committee to take this subject into consideration and report at the next meeting of the State Medical Society.

Motion carried.

Dr. Seaman: Now we have created a Committee on Medical Legislation and we must stick to that subject until it is settled right. That Committee must have some funds. We came here last year and asked the Society for $180. I think that was a very modest request, and I think the Society can afford to give the Committee, if necessary, a small sum this year, I would, therefore, make a motion that the sum of $200 be appropriated for the Committee on Medical Legislation.

Dr. Walbridge: This question I do not think has been treated in quite so serious a manner as I think it ought to be. Any man who did anything last winter towards getting the Medical Law passed, must certainly know the amount of work that must be done, and the time that must be spent in doing it. It cannot be done staying at home in your office, or writing letters or sending telegrams. Somebody must be in Madison often and spend time there, and it is going to cost money, and I hope it will be looked at from a serious and not from a light standpoint. We must have funds.

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Dr. Bartlett: I second the motion which has been made and support it heartily. We have been agitating for medical legislation for twenty-two years. A good many of us have gone out to Madison and attended every legislature and taken plenty of money with us and spent it there. We are getting old, gray, and tired in this matter, and you just begin to reap the fruits of our labor. Can you not vote the paltry sum of $200 to encourage this matter. I feel like the Frenchman whose sympathies were aroused to the tune of $5, when he said, "I feel sorry for that man $5, how much do you feel sorry for him?" If you have sympathy for this thing and wish it carried on, you must furnish the means.

The motion was then carried.

The Society then proceeded to the election of officers.

Dr. Würdemann: Mr. President, I esteem it an honor to nominate for the chief presiding officer of this Society for the ensuing year, a man whom you all know, and who for over a decade has attended the meetings of this Society, has been prominent in its discussions and deliberations, and whose thorough knowledge of the business of the Society, as well as his scientific attainments will make him well fitted to act as our first officer for the ensuing year. We, as well as he, will be honored if we elect him to this position. I desire to place in nomination, Dr. Herman Reineking, of Sheboygan.

Nomination seconded by Dr. Fuchs.

Dr. Robinson: I recognize the ability of Dr. Reineking, but Dr. Reineking has the privilege of being a young man, and I would like to place in nomination one from among those men who have attended the meetings of this Society until their hairs are gray, and I therefore place in nomination Dr. Phillips, of Stevens Point.

Nomination seconded.

Dr. Horace M. Brown: On the principle of old men for counsel and young men for war, I hope we will stand by the nomination of Dr. Würdemann — it looks like war.

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Dr. Hitz and Dr. Coon were appointed as tellers.

Dr. Bartlett: Dr. George F. Witter, of Grand Rapids, of this State has been a member of this Society for a great many years; he has read many valuable papers, and has taken part in many discussions; he is a member of the State Board of Health and a very valuable man; he is somewhat advanced in years. He is in California now with his wife, who is in bad health. I know that he would consider it a great honor if he could be made an honorary member of this Society, and therefore I move that he be elected an honorary member of the Wisconsin State Medical Society.

Motion carried unanimously.

The President: As the Committee on Medical Legislation, I will appoint Drs. J. J. McGovern, Levings, J. C. Reynolds, Seaman, and Sarles.

As Committee on Midwifery, in accordance with Dr. Noer's motion, I will appoint Drs. Noer, Tanner, and Sheldon.

The President then announced the vote for president as follows: Total number of votes cast 102, of which Dr. Reineking received 73, and Dr. Phillips 29.

A motion was then made that the informal ballot be declared formal and that Dr. Reineking be declared duly elected President of the Society for the ensuing year.

Motion seconded and unanimously carried, and Dr. Reineking was then pronounced by the President to be elected President of the Society for the ensuing year.

Dr. Earles: Inasmuch as we have elected our war president, in accordance with Dr. Brown's suggestion, I would like to nominate for counsel, the gray-haired man from Stevens Point, Dr. Phillips.

Motion seconded.

Dr. Levings: I move that the Secretary of the Society be instructed to cast the ballot of the Society for Dr. John Phillips as First Vice-President of the Society for the ensuing year.

Motion seconded and unanimously carried.

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The Secretary then cast the ballot and the President announced that Dr. John Phillips, of Stevens Point was duly elected First Vice-President of the Society for the ensuing year.

Dr. Chas. W. Oviatt, of Oshkosh, was then elected Second Vice-President of the Society for the ensuing year by acclamation.

Dr. C. S. Sheldon was then elected Secretary of the Society for the ensuing year by acclamation.

Dr. S. S. Hall was then elected Treasurer of the Society for the ensuing year by acclamation.

Dr. F. E. Walbridge, of Milwaukee, was then elected, by acclamation, Censor for the term to expire in 1901, in place of Dr. William Meacher, deceased.

Dr. Earles: Have we an Obituary Committee? If not, I move that a committee of three be appointed to draft suitable resolutions upon all the deaths of members that have occurred during the past year.

Motion carried.

Dr. Fuchs: I would like to call the attention of the Chair to the fact that he has omitted to appoint a Committee to act on Vital Statistics.

The President: I will appoint as Committee on Vital Statistics, Dr. Fuchs, chairman, Dr. Coon, and Dr. Jackson.

As Obituary Committee I will appoint Dr. Earles as chairman, and Dr. Nielson and Dr. D. J. Hayes.

I will appoint Dr. Bartlett and Dr. Tanner as a committee to escort our new President to the chair.

Dr. Bartlett: Mr. President, we have the honor of presenting to you Dr. Herman Reineking, the President-elect of the Society for the coming year.

Dr. Mackie: Gentlemen, it is needless for for me to introduce to you Dr. Reineking.

Dr. Reineking: Mr. President, and members of the Wisconsin State Medical Society: It is unnecessary to say that I

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feel very thankful towards you for the confidence you have expressed in me by electing me President of this Society for the ensuing year. I am fully conscious of the great responsibility which has devolved upon me in accepting this election, and I enter upon the duties of this office with a feeling of grave responsibility, and with some misgiving. However I am encouraged by the assurance that you will all stand by me this coming year in bringing the work of this Society up to the highest possible standard, and in doing credit to the motto of this State, "Forward." We will now listen to the annual address of the retiring President, Dr. William Mackie.

Dr. Mackie: I wish you would dispense with this address. It is a History of Pathology from the time of Hippocrates to the time of Virchow. I have collected all the leading ideas as near as I can, that have influenced the practice of medicine, from that time on. It is very interesting to study but very uninteresting to listen to.

The Society insisted that the paper should be read.

Dr. Mackie then read his paper.

Dr. Mackie: Let me thank the various chairmen of the committees and thank you all for your kind courtesies.

In leaving you now I bespeak for Brother Reineking the kind courtesies which you have extended to me during the past year.

The President: This address of President Mackie will go to the Publication Committee without discussion, as is the usual custom.

Dr. Burgess: I move a vote of thanks to the retiring President for his services during the year.

Motion unanimously adopted.

Dr. Hitz: I move that a vote of thanks be extended to the Arrangement Committee and the railroads and the hotels for their courtesies during this meeting.

Motion unanimously carried.

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The President: I will nominate, subject to the approval of the Society, as members of the Committee on Ethics for the term expiring 1901, Drs. E. S. Hayes, A. H. Levings, and H. B. Tanner, and to fill the vacancy created by the election of your President, I will nominate Dr. Earles for the term to expire in 1900. This nomination, according to the Constitution, is subject to the approval or rejection of the Society.

Dr. Bartlett: I move that the Society approve these nominations. Motion unanimously carried.

There being no further business presented, on motion the Society adjourned at 6:00 o'clock P. M.

CHARLES S. SHELDON, *Secretary.*

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THE ANNIVERSARY BANQUET

was held at the Plankinton House on Thursday evening instead of Friday afternoon, as formerly. It was, as it always is, a most enjoyable affair, and has become firmly established as a permanent feature of the meeting. The evening is certainly the most natural and appropriate time for such a gathering, but there may be a question whether we can afford the time from our scientific proceedings. It affords an agreeable break, however, in the more serious work of the Society, in case it shall be found not to interfere too much with the regular program. The attendance was larger than ever before, something over 200, including many ladies, the wives and friends of the members. This was an especially agreeable feature and should be encouraged in the future.

The "Saw Bones Choir" was excused from duty, owing to various disabilities of several members. The singing by the whole Society, however, was uncommonly good, and was led by an excellent orchestra in the gallery.

The banquet, occurring as it did at the very beginning of our Spanish war, was naturally made the occasion of a genuine patriotic demonstration, the speeches being strongly tinged with the all-absorbing theme, while between the toasts the Society sang with much enthusiasm such airs as "The Star Spangled Banner," "Tramp, Tramp, Tramp," "America," etc.

Magister Wingate, the Anniversary Chairman, presided with his usual eloquence and grace over the following program:

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MAGISTER, DR. U. O. B. WINGATE.

"A Fig for your Bill of Fare,
Show me your Bill of Company."
—Jonathan Swift.

1. THE MEDICAL SOCIETY OF THE STATE OF WISCONSIN.

"In the future as in the past, may her banner ever bear the State's motto, 'Forward.'"

DR. WILLIAM MACKIE, Prest. of the Society.

SONG.

2. THE STATE OF WISCONSIN AND THE MEDICAL PROFESSION.

"A good Physician is like a good Statesman, for it is the aim of both to alleviate the miseries of existence."
—Li Hung Chang to Dr. Kitasato.

LIEUT.-GOV. EMIL BAENSCH.

SONG.

3. THE CLERGY AND THE MEDICAL PROFESSION.

"All that is new is not progress, we sometimes follow the will-of-the-wisp light of error into devious paths, from which we return not always enough wiser for the lesson to prevent again going astray in another direction."
—Dr. J. K. Bartlett.

REV. W. G. ELIOT

SONG.

4. LAW AND MEDICINE.

"A multitude of laws in a country is like a great number of Physicians, a sign of weakness and malady."*—Voltaire.*

EUGENE ELLIOTT, Esq.

SONG.

5. THE PRESS AND THE MEDICAL PROFESSION.

"Give us but knowledge, though by slow degrees,
And blend our toil with moments bright as these;
Let friendship's accents cheer our doubtful way,
And Love's pure planet lead its guiding ray."
—Dr. O. W. Holmes.

COL. J. A. WATROUS.

SONG.

6. THE MEDICAL PROFESSION.

"While we rejoice in that to which our profession has already attained, we look with longing eyes to the victories of the near future."*—Dr. H. O. Marcy.*

—DR. J. A. JACKSON.

SONG.

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NEW MEMBERS

ADMITTED DURING THE SESSION OF 1898.

The Censors reported that they had examined the credentials of the following ladies and gentlemen, candidates for admission to membership in the Society, and found them correct in all respects, and they accordingly recommend that they be admitted to membership.

The Censors' report was unanimously adopted as made.

Bading, Gerhard A., graduate of Rush Medical College, 1896.

Bechmann, Chas. Richard, graduate of Rush Medical College, 1896.

Becker, Wilhelm, graduate of Milwaukee Medical College, 1897.

Bodenstab, Wm. H., graduate of Jefferson Medical College, 1893.

Boerner, Reinhardt W., graduate of Wisconsin College of Physicians and Surgeons, 1896.

Brown, George V. I., graduate of Milwaukee Medical College, 1895.

Brown, Robert Curtis, graduate of College of Physicians and Surgeons, New York City, 1892.

Buland, George L., graduate of Rush Medical College, 1884.

Byers, Frederick W., graduate of Rush Medical College, 1863.

Christensen, Christian, graduate of Medical Department, University of Norway, 1879.

Christensen, Emil S., graduate of Wisconsin College of Physicians and Surgeons, 1896.

Coakley, Walter Byron, graduate of Milwaukee Medical College, 1898.

Coffey, Charles James, graduate of Medical Department, University of City of New York, 1894.

Confer, Francis Marion, graduate of Rush Medical College, 1882.

Conley, John Mayo, graduate of Chicago Medical College, 1897.

Doege, Karl W., graduate of Western Reserve Medical College, Cleveland, 1890.

Dougherty, Albert Andrew, graduate of Starling Medical College, Columbus, O., 1896.

Edsall, Frank Hynard, graduate of Medical Department, University of Pennsylvania, 1885.

Evans, Edward E., graduate of Medical Department, McGill University, Montreal, 1887.

Farr, Lyman R., graduate of Chicago Medical College, 1884.

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Gibson, James, graduate of College of Physicians and Surgeons, Chicago, 1886.

Gilbert, Herman, graduate of Medical Department, University of Heidelberg, 1896.

Graham, Chas. W., graduate of Detroit Medical College, 1896.

Gratiot, C. C., graduate of Jefferson Medical College, Philadelphia, 1880.

Grosskopf, Ernest Chas., graduate of Milwaukee Medical College, 1897.

Gygax, Paul, graduate of Medical Department, University of Berne, Switzerland, 1889.

Gundersen, Adolf, graduate of Medical Department, University of Christiania, Norway, 1890.

Hall, J. Storrs, graduate of Milwaukee Medical College, 1897.

Hoffman, Norman, graduate of Wisconsin College of Physicians and Surgeons, 1896.

Hooper, Edgar Steven, graduate of Rush Medical College, 1895.

Karsten, Adrian C., graduate of Wisconsin College of Physicians and Surgeons, 1897.

Kemper, William G., graduate of Rush Medical College, 1882.

Keithley, John W., graduate of Kentucky School of Medicine, Louisville, 1893.

Kletzsch, Gustav A., graduate of Bellevue Medical College, New York City, 1882.

Kovats, Edmund, graduate of Medical Department, University of Vienna, Austria, 1870.

Law, Allan Robert, graduate of Rush Medical College, 1870.

Ladoff, Anna Menkin, graduate of Woman's Medical College, St. Petersburg, 1882.

Lockwood, G. S., graduate of Medical Department, University of Michigan, 1870.

Luchsinger, Samuel Chas., graduate of Milwaukee Medical College, 1898.

Lynch, John W., graduate of Wisconsin College of Physicians and Surgeons, 1897.

McNary, Wm. Duncan, graduate of Rush Medical College, 1896.

McShane, B. E., graduate of College of Physicians and Surgeons, Chicago, 1895.

MacGregor, Samuel A., graduate of Detroit College of Medicine, 1895.

Martin, M. T., graduate of Bellevue Hospital Medical College, New York City, 1881.

Meany, John E., graduate of Milwaukee Medical College, 1898.

Millard, Frank D., graduate of Milwaukee Medical College, 1897.

Moe, Anton J., graduate of Rush Medical College, 1897.

Monsted, John W., graduate of Detroit College of Medicine, 1894.

Morley, Frank Ellsworth, graduate of Rush Medical College, 1893.

Nixon, Henry G. B., graduate of Detroit College of Medicine, 1887.

Notbohm, Wm. Richard, graduate of Milwaukee Medical College, 1898.

Noyes, J. C., graduate of Rush Medical College, 1863.

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O'Malley, Michael, graduate of Rush Medical College, 1888.

Pfister, Franz, graduate of Medical Department, Wooster University, Cleveland, O., 1895.

Regan, Eugene D., graduate of Milwaukee Medical College, 1898.

Rinehart, W. T., graduate of Jefferson Medical College, Philadelphia, 1886.

Roberts, George W., graduate of Rush Medical College, 1869.

Rood, John F., graduate of Chicago Medical College, 1881.

Sanborn, Marcus Eugene, graduate of Medical College of Ohio, Cincinnati, 1891.

Sawbridge, Edward, graduate of Rush Medical College, 1883.

Schultz, Edward Frank, graduate of Rush Medical College, 1897.

Schulz, F. M., graduate of Rush Medical College, 1890.

Stoddard, Charles Hatch, graduate of College of Physicians and Surgeons, Chicago, 1892.

Suiter, F. C., graduate of Medical Department, University of Iowa, Iowa City, 1885.

Thayer, C. E., graduate of Chicago Medical College, 1883.

Tibbitts, Ulysses Jas., graduate of Milwaukee Medical College, 1898.

Thorndike, Wm., graduate of Medical Department, Harvard University, 1896.

Trowbridge, Chas. Henry, graduate of College of Physicians and Surgeons, New York City, 1894.

Wallis, Jos. Hooker, graduate of Milwaukee Medical College, 1898.

Werner, O. Edward, graduate of Wisconsin College of Physicians and Surgeons, 1894.

Willard, L. Mortimer, graduate of College of Physicians and Surgeons, Chicago, 1891.

Willis, Sidney S., graduate of College of Physicians and Surgeons, New York City, 1890.

Winslow, Rush, graduate of Bellevue Hospital Medical College, New York City, 1871.

Wray, Wm. Edgar, graduate of College of Physicians and Surgeons, Chicago, 1897.

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REGISTER OF MEMBERS

IN ATTENDANCE DURING THE FIFTY-SECOND ANNUAL SESSION.

Abaly, W. C.
Allen, Stanton
Amundson, A. C.
Bach, J. A.
Ballard, J. A.
Barnes, J. Steele
Barnett, J. R.
Bartlett, E. W.
Batchelor, W. A.
Beebe, Carl M.
Bechman, Charles R.
Becker, William F.
Bell, Samuel
Bennett, Lewis F.
Bennett, Wm. C.
Beutler, Wm. F.
Bill, B. J.
Binnie, John
Bird, H. R.
Bishop, Thos. W.
Bodenius, F. H.
Boorse, Lorenzo
Bradfield, J. A. L.
Brodsky, F. A.
Bromley, F. W.
Brown, Horace M.
Brown, Isaac M.
Brown, L. S.
Buckmaster, S. B.
Burgess, A. J.
Caldwell, Margaret
Canright, Orlo S.
Chandler, Ada B.
Chandler, Ralph
Chapman, Francis M.
Christiansen, Christian
Chrysler, Oscar
Clark, Almon
Clark, Miles H.
Cohn, Arthur H.
Comfort, Aaron I.
Confer, Francis M.
Conkey, Chas. DeW.
Coon, J. W.
Copeland, Ernest
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Corbett, M. E.
Cossitt, Willet S.
Crosse, Theo. P.
Currens, J. R.
Dawley, Geo. T.
Daniels, Alfred D.
Deahofe, S. P.
Dodson, J. M.
Dodson, N. M.
Dougherty, Albert A.
Dougherty, Clement F.
Earles, W. H.
Eastman, Wm.
Elliott, M. Agnes
Elmergreen, Ralph
Evans, Edward E.
Feld, Carl R.
Fish, Edmund F.
Fisk, M. H.
Fitzgibbon, Thos.
Flett, Charles
Frank, Lewis F.
Fraser, Alexander C.
Friend, Samuel H.
Fuchs, Albert
Fuller, Hezekiah D.
Garlock, F. R.
Gasser, Herman
Genter, Arthur E.
Gillen, Frederick C.

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Graettinger, Alois
Gratiot, C. C.
Gregory, L. M.
Ground, Wm. E.
Gudden, B. C.
Gudex, V. A.
Gunderson, Adolf
Hall, Sidney S.
Hall, J. Storrs
Hallock, W. E.
Hanson, Wm. C.
Hay, Thomas H.
Hayes, D. J.
Heidner, Gustav A.
Helm, Ernest C.
Hewitt, M. R.
Hill, Warren B.
Hirth, G. J.
Hitz, Henry B.
Hodgson, A. J.
Holbrook, Arthur T.
Howard, J. J.
Hoyer, G. C.
Jackson, J. A.
Jermain, Lewis F.
Jurgens, L. W.
Kahn, Joseph
Kaumheimer, G. J.
Keller, Sebastian
Kelley, Edw. J.
Kelley, Julia P.
Kellogg, E. Wells
Kempster, Walter
King, C. F.
Kratzsch, A. W.
Kratzsch, Richard
La Count, D.
Law, Allan R.
Lemon, Chas. H.
Levings, A. H.
Lewis, L. V.
Lindsay, H. E.
Lyman, Wm. B.
Lynch, Daniel W.
Mackie, W.
Madden, John
Malone, Thos. C.
Malone, W. F.
Marks, Solon
Marquardt, C. H.
Maurer, A. A.
McGovern, John J.
McGovern, Patrick H.
McGovern, W. P.
McNeel, J. Henry
Mears, G. F.
Mereness, Dwight
Mills, James
Mishoff, Ivan D.
Mulholland, John F.
Munro, Sarah R.
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Nobles, Byron O.
Noer, Julius
Nott, G. Wallace
Nye, F. T.
O'Brien, James S.
Ogden, H. V.
O'Keef, Patrick
Orvis, E. J.
Oviatt, Chas. W.
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Parham, G. H.
Patek, Arthur J.
Pember, John F.
Perrin, Geo. H.
Perry, Fred J.
Phillips, John
Puls, A. J.
Purtell, Edw. J.
Quam, Jacob
Redelings, Theodore J.
Reineking, Herman
Reynolds, J. C.
Robinson, Byron
Rogers, Frederick C.
Rood, C. A.
Rood, Galen
Sarles, W. T.
Sauer, Frederick N.

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Saunders, George
Sayle, R. G.
Schaper, Chas.
Schaper, Herman
Schiller, Leopold
Schultz, Thos. N.
Scollard, John T.
Scollard, W. E.
Seaman, G. E.
Sears, Harry B.
Sercomb, Harriet F.
Sheldon, C. S.
Shimonek, F.
Sifton, Harry A.
Smith, Byrant
Sperry, Selden B.
Sperry, Willis P.
Stack, Stephen S.
Steele, Geo. M.
Steffen, I. D.
Suiter, Frank C.
Tanner, H. B.
Thomas, Austin H.
Thorne, Jas. P.
Tower, F. J.
Townsend, E. H.
Valentine, L. P. A.
Vincent, G. R.
Vivian, Stansmore
Von Neupert, Carl, Jr.
Von Neupert, Carl, Sr.
Walbridge, F. E.
Walsh, Chas. C.
Washburn, Wm. H.
Wegge, Wm. F.
Werner, O. Edward
White, Adam G.
White, Moses J.
Whyte, Wm. F.
Willson, Chas. G.
Willis, Sidney S.
Windesheim, Gustav
Wingate, U. O. B.
Wintermute, Chas. E.
Witter, G. F.
Wray, Wm. Edgar
Wright, Frank R.
Würdemann, H. V.
Youmans, L. E.
Zimmermann, Chas.
Zinns, A. J.

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PRESIDENT'S ADDRESS.

BY WILLIAM MACKIE, M. A., M. D., OF MILWAUKEE.

The introduction of a section on Pathology at this meeting suggests the appropriateness of a short historical reference to the leading theories that have influenced medicine from the time of Hippocrates to that of Virchow when he announced his cellular pathology and laid the foundation of modern pathology. Prior to the seventeenth century everything was speculative. Morgagni then directed attention to the anatomical products of disease. Pathology was again neglected in favor of theory until the teachings of Bichat toward the close of the eighteenth century, and was finally firmly established by the French School of Pathological Anatomy and the new Vienna School.

Hippocrates (B. C. 500) regarded the body as consisting of four elements—water, fire, air, and earth. There were also four cardinal fluids—yellow and black bile, blood and mucus; and four primary qualities—warmth, coldness, dryness, and moisture. The uniform action and reaction of all these upon and between each other constituted health, and any irregularity in this action and reaction disease. This is similar to the humoral pathology as propounded by Thessalus (B. C. 380), the founder of the Dogmatic School. This school received its name from its speculative cause of disease in contradistinction to an actual cause as based on observation, which is ignored. Thessalus and his followers assumed that the mucus flowing from the brain, and the different kinds of bile, yellow and the black, were the cause of disease, hence they had mucous or bilious diseases. Aristotle, the founder of comparative anatomy, from his researches on animals, held similar views. Pilinus (B. C. 280) rejected all the theories of the Dogmatic School and placed the greatest reliance upon

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experience—the Empirical School. He and his followers regarded as useless a search for the cause of disease and aimed at a practical result, the cure of their patients. Their "Empiric Tripod" was summed up in accident, history or remembrance of similar cases, and analogy or the application of similar cases. For example, if a man had a scar on his head and subsequently became insane, the scar was the hidden and exciting cause. Following this came the School of Solidism, established by Asclepiades, who considered matter as consisting of atoms of too small dimensions to be made out by any of the senses and which, in the formation of bodies, left small spaces or channels in which also circulated or moved finer atoms. On this theory health consisted in the quiet and regular action of these atoms, and if they became feeble, boisterous or irregular, disease resulted, the cause of which entered either with the air inspired or the ingested food. Special forms of disease depended upon the size of the atoms; thus quotidian fever resulted from the largest atoms, tertian fever from the medium sized, and quartan from the finest. The humoral theory was not wholly rejected but only occupied a secondary place. The views of this school were discarded by Athenaeus (A. D. 70) and replaced by the spiritual principle of the "pneuma." This pneuma enters by the organs of respiration, reaches the heart and permeates the whole body through the vessels. When it works regularly and is united with both warmth and moisture, it occasions health—mixed with warmth and dryness it originates acute diseases—with cold and moisture, phlegmatic diseases, and with cold and dryness, melancholy. Agathinius (A. D. 90), a pupil of Athenaeus, endeavored to combine the ideas of the pneumatic school with those of the empirical and solidist, and in doing so originated the Eclectic School—the greatest exponent of which was Galen, or, more accurately, he outlined an Eclectic system peculiarly his own. As in the other sys-

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tems, he recognized warmth, coldness, dryness, and moisture as the primary qualities, and the four elements, earth, air, fire, and water. To these correspond the four humors—water to mucus, fire to yellow bile, earth to the black bile, and blood to a uniform mixture of all the elements. The life-giving principle is the pneuma, which is constantly renewed through the respiration. Health depends upon the proper proportion of the solid and fluid constituents and a correct mixture of the humors, any variation constituting disease. An overflow, or corruption of the humors, gives rise to putrefaction, which he considered the general cause of fever. An influx of blood into unusual places gives rise to inflammation, characterized by the four cardinal symptoms of redness, heat, swelling, and pain. Galen's teachings dominated until about the fifteenth century when Theophrastus von Höhenheim (1463), or Paracelsus, discarded the fundamental humors and replaced them by his fundamental elements, salt representing the soluble, sulphur the combustible, and mercury the volatile. The body was composed of these fundamental elements; and this constituted his universal anatomy. These elements were under the influence of his Archaeus, or "living spirit," whose habitat was the stomach, its function being to separate the material useful for nutrition, or the essence, from the useless or the poison. It was the alchemist of the body. Health, then, consisted of a proper proportion of salt, sulphur, and mercury and a correct action of the Archaeus—disease, the reverse. The fundamental humors of Galen were only the results and the expression of disease. Theophrastus was the first to divide syphilis into local and general, primary and secondary, establish the fact of its being hereditary, and indicated its influence on the course of other diseases. Von Helmont (1578–1644) discarded the elements of Paracelsus, and substituted water as the element from which everything takes origin, air being only a secondary element. He recognized a spirit belonging to man and animals and an Archaeus

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common to all natural objects. Disease was something active and not simply loss of health—its general cause being the "Fall of Man." Special diseases depended upon a perverted action of the Archaeus. The active principle of the Archaeus is a ferment which, if through some mistake of the Archaeus, reaches some improper place, disease results, *e. g.*, the acid secretion of the stomach into the joints in gout. Morbid ideas of the Archaeus also caused disease. They arise from anxiety, fear, terror, etc., *e. g.*, dropsy from the enraged Archaeus preventing the excretion of the urine. This was known as the Dynamic School. The next was the Chemical, Humoral, or Iatrochemical, founded by Sylvius (1614–1672). It dispensed with the fundamental elements of Galen and the Archaeus of Paracelsus and replaced them by its triumvirate, viz: saliva, pancreatic fluid and bile, under the influence of the "vital spirits" distilled in the brain from the blood and carried by the nerves (which were hollow) to the body. Fermentation and effervescence played an important part. Saliva and pancreatic fluid were acid, and bile alkaline; during digestion an effervescence occurs, and a gas, or ferment, results which forms part of the chyme. Another ferment originates in the spleen and enters the blood. It is the undisturbed performance of this fermentation without the appearance of an acid or alkaline salt, that constitutes health. If either occur in excess disease results. Thus there are two groups of diseases due to either an acid or an alkali. When bile is alkaline and in excess, it causes high and continued fever, and if acid, engorgements. The pancreatic juice under similar conditions gives intermittent fever, and if alkaline, its effervescence with the bile is imperfect and an acid vapor forms which occasions epilepsy, palpitation, etc. The saliva causes hectic fevers, and the vital spirits, nervous diseases. Willis (1622–1675) also a humoral pathologist, differed from the doctrines of Sylvius. He had five elements; water, earth, salt, sulphur, and a "spiritus" in addition to fer-

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mentation. Diseases of the blood are ascribed to fermentation and effervescence, the vital spirits being the prominent factor. Nervous diseases are of similar origin, *e. g.*, hysteria results from the union of the spiritus with impure blood from the spleen, and to the false fermentation and derangement of the resulting spirit.

The Iatromechanical School appeared in opposition to the foregoing. It returned to the principle of solidism and explained everything on mechanical and physical laws. Digestion was a mechanical trituration and absorption resulted from the pressure of the intestinal movements on the intestinal contents. Secretion followed from the resistance met with at the curves and the narrowings of the vascular system, warmth from friction of fluids on the walls of the vessels, sensation from vibration of nerves, etc. Any disturbance of a physical or mechanical process caused disease, and its existence was determined by physical means, weighing, measuring, etc.

Sydenham (1624–1689) denounced all these systems and returned to the Hippocratic doctrine of observation and experience as the only sound basis upon which medicine must advance. In pathology he was a humorist. To him disease was something active; it was nature's effort to remove something abnormal from the blood. Fever was a purifying process, what he termed an inflammation of the blood, and its purifying property was indicated by the "*crusta phlogistica.*" The cause of disease he ascribed to unknown gases which flow from the bowels of the earth, a geographical classification of disease, or to defects in the humors from an improper mode of life.

This brings us to the seventeenth century when pathology, or rather pathological anatomy, became fully established, a diagnosis being confirmed by a *post-mortem* examination. Stones of the kidney, bladder and gall-bladder were described early in the sixteenth century, more as curiosities than as pathological conditions. Dodoëns had also described ulcer

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of the stomach, degenerations of kidneys accompanied by hypertrophy of the bladder. It was during this period that the microscope, invented in 1608, was first applied to medical science. Malpighi described in 1665 the blood-corpuscles, later the lung cells and the pigmented cells of rete Malpighii; Leonwenhoeck in 1683 the infusoria, torula cerevisiæ and the first bacteria—the leptothri of the buccal mucus; Bonomo in 1687, the itch mite in the pustules of scabies and Kircher sought in the micro-organisms of the air, the cause of infectious diseases.

Morgagni (1682–1772), the founder of modern pathological anatomy, first directed attention to the anatomical products of disease, but erroneously regarded these products as the cause, to the neglect of a remote cause. He sought to deduce from his pathological investigations a cure for the disease.

In the following century numerous theories and systems were advanced. Boerhaave (1688–1738) established an eclectic system, basing his pathological ideas on those of the solidist, dynamic, pneumatic, and humoral schools rendered more exact from the use of the microscope.

Gaub (1705–1780), an exponent of this system, and the author of the first complete work on pathology (Institutiones pathologiæ Medicinalis: Leyden, 1750) recognized an independent "vital force" which resided in the solid parts, capable of energy and receptivity. Any derangement of this would give rise to pathological change.

In opposition to the chemical and mechanical systems, the materialistic, Stahl (1660–1673), promulgated the doctrine that the "soul" (anima) is the supreme principle, life-giving and life-preserving. When it acts orderly, producing relaxing and contracting movements, there is health. If these "tonic" movements are hindered or obstructed, disease will result. Such hindrances or obstructions may proceed from the organs of the body, or the "soul." The latter in conse-

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quence of its superior intelligence, perceiving the tendency of noxious powers threatening, immediately excites such movements. Disease is the effort of the soul to restore these tonic contractions.

Hoffmann (1718) combined the two preceding in the formation of the Mechanico-Dynamic System. He replaced the supernatural "soul" of Stahl by his material "Æther," which was secreted from the blood in the brain and stored in the medulla and heart, from which it permeated the body through the blood-vessels and nerves. The inherent forces of matter as they exist in the body are revealed by movement, action and reaction, contraction and relaxation, the tonus. These movements are maintained by the "Æther;" the body is simply a machine; regularity of its movements constitute health, the reverse disease. If the influx of the material Æther be too strong we have spasm, and if too feeble, atony. Thus fever is due to spasm of the vessels of the spinal cord and inflammation to the spasmodic arrest of the circulation in the inflamed area. Anything that produced movement in excess was unnatural, and consequently a disease. It might, however, have a beneficial effect, as an emetic or a cathartic, which excite spasmodic contractions of the stomach and intestines. Again in plethora, hemorrhages are beneficial if only the superfluity be removed, otherwise dangerous.

Cullen (1712–1790) in criticising the doctrines of humoral pathology (Boerhaave's) admitted that the fluids of the human body suffer various morbid changes, and that upon these, disease may primarily depend, but maintained "that the nature of these changes is seldom understood, and more seldom still is it known when they have taken place; that our reasonings concerning them have been, for the most part, purely hypothetical; have therefore contributed nothing to improve, and have often misled the practice of physic." There had been a total neglect of the state of the moving powers of the animal body, or living solid parts of the body. Upon these he

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based his pathological solidism, or a nervous pathology—the nerves being the chief agents. The Soul of Stahl and Æther of Hoffmann were replaced by what he termed "nervous force," "activity," or "principle," otherwise called "animal force," or "energy of the brain." This produces spasm or atony. It originates in the brain and is conducted outward by the nerves, a nerve-center exercising special influence upon every part of the body. The causes of disease all act through the brain and nerves, and are generally of a debilitating character. Inflammation of the joints in gout Cullen regarded as a reparative effort for the atony of the stomach or organs of digestion upon which this disease depends. The fever proceeds from the brain. He did not discard the humoral causes of disease altogether, recognizing as the cause of scrofula an acridity; of putrid fever, a putridity of the humors, etc.

Many other systems were evolved during this period, but the most important was that of John Brown (1735–1788) known as the Brunonian System. Brown held that life was not a natural condition but artificial, the result of irritations in constant action. These irritations may be either external or internal. The external consist of food, blood, the fluids in general, warmth, air, etc.; the internal are the functions of thought, feeling, muscular activity, etc. They may be either general or local; general arouse excitement in the whole body; the local act first on an individual part and gradually extend to the whole body. According to this, health is an intermediate grade of excitement; disease, a too high or low. The excitement varies with the degree of the irritation; if too severe, death results; if intermediate, ordinary weakness or asthenia, either direct or indirect. The former is due to an excess of excitability from deficient irritation, and the latter to a diminution or exhaustion of the excitability from over-irritation. Where irritation is deficient, new irritations are to be added; if in excess, a weaker must be substituted to restore the balance which constitutes health. He is said to

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have based his theory upon his own personal experience of gout, observing that it improved under the use of stimulants and became worse under a weakening treatment.

Rush rejected the theories of Boerhaave and Cullen which he introduced into this country about 1760, and championed that of Brown in a modified form, recognizing in his therapeutics only depressants and stimulants.

Toward the end of the century the theory of realism was brought forward by Pinel (1745–1826), and extended by Bichat. It forms the foundation of the medicine of the nineteenth century. It proceeded from an analytical standpoint, establishing a diagnosis from the symptoms. Pinel gave prominence to symptoms, disease being to him an entity, composed of characteristic symptoms occurring in a regular order and varying only in unessential points. His aim was a diagnosis, easy under such a doctrine. Bichat, on the other hand, considered symptoms of little value unless their origin could be located anatomically and some pathological change there noted. He wrote, "Take away some fevers and nervous troubles and all else belongs to the kingdom of pathological anatomy." There were two forms of life, "organic" and "animal." The former was common to plants and animals and regarded as unconscious; the latter peculiar to animals and conscious. His "Vital properties" were sensibility and contractility (irritability of Haller), subdivided into an organic or unconscious, and animal or conscious. To each tissue was ascribed a special kind of contractibility and sensibility. There were twenty-one tissues which went to make up the body. The harmonious working of the "Vital properties" in all the different tissues constitutes health. If one of the tissues be affected, the balance of the tissues of the organism remaining sound, there would be disease of that alone — a local disease. Where several tissues are involved there arises a more general disease, and death results when the "Vital properties" of the unaffected are overbalanced by the affected;

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this not in a numerical sense, but in the importance of the tissue involved to the life of the individual.

Early in the nineteenth century there were two opposing schools in France, that of Physiological Medicine and that of Pathological Anatomy. The former held a mixture of the views of Brown, Pinel, and Bichat. Broussais, the leading exponent of this school, considered heat as the external irritant (Brunonian) upon which life depended. It excited chemical changes in the body, and these give rise to sensibility and contractility. The withdrawal of the external irritant heat, and consequent cessation of sensibility and contractibility, (irritability) results in death. An excessive or diminished action causes disease, a moderate, health. The irritation originates in some diseased organ, and is transmitted through the sympathetic system. The most frequent source of irritation was the stomach — a gastro-enteritis. From this originated all fevers and infectious diseases. Only local organic lesions with subsequent functional disturbances were recognized. There were no purely functional diseases.

The Pathologico–Anatomical School originated with Corvisart, Dupuytren, and Laennec. This school dispensed with all former deductive theories and directed special attention to the pathological products of disease. These were described and recorded with the greatest accuracy, weighing, measuring, etc. Removal of the local products and not the cause, was the aim of medicine. Where no pathological change was found, disease did not exist. Functional diseases and those of the fluids had no existence because they were unsupported by cadaveric evidence. Andral and Magendie, adherents of this school, from the chemical examination of fluids admitted a kind of "vitality" as a cause of functional disease. Magendie limited it to the nervous system, Andral extended it to all diseases where no material change in the tissues of any organ was discovered. A pregnant description of this school is given by Isense (1844), himself an adherent: "The French

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physician who stands at the bedside of a patient behaves as follows: he looks upon him, and with a thorough knowledge of anatomy, divides his body into the systems of Bichat. Reasoning then more or less after the manner of Broussais he assumes that one of these systems is suffering from inflammation. Which system it is, where is the seat, what the extent and the grade of inflammation, he investigates with every sense, especially by touch and with the aid of the stethoscope and percussion. Then he orders the withdrawal of solid food, more or less gentle remedies, and antiphlogistic and revulsive treatment. If death ensues he investigates by means of pathological anatomy how far his diagnosis (not his treatment) may have been correct in accordance with the precise details furnished by Andral, Cruveilheir, etc." The treatment was purely expectant, the "vis medicatrix naturae" was given full sway, so that the pathological changes could proceed undisturbed.

Offshoots of this school were the Dublin School and the new Vienna School. The former, under the leadership of Stokes and Cheyne, adopted the pathological teachings in so far as necessary to diagnosis, and directed more particular attention to the microscopic changes in the pathological product.

The Vienna School, headed by Wunderlich, Rokitansky, and Skoda, firmly established the teachings of the French Pathologico-Anatomical School in opposition to the school of Natural History which dominated German medicine from 1830–1850. Schönlein, the exponent of this school, regarded pathological products as the concrete expression of the abstract, independent entity, "disease," whose relation to the organism was that of a parasite temporarily sojourning in it, and which gains admission from without. Rokitansky demonstrated the succession of pathological changes in disease, and from his chemical examination of exudates discovered the essence of morbid processes. This he utilized to establish

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a new humoral pathology — the so-called doctrine of crases. This theory he soon abandoned. Skoda carried the teachings of the school into practice, if diagnosis alone may be considered as such. An exact and precise anatomico-pathological diagnosis was all that was necessary. In therapeutics all adherents of the school were nihilists, a standing prescription being "a little bitter almond water mixed with considerable common water, sweetened and fortified with syrup."

In contrast to the macroscopic pathology of the foregoing, Virchow directed particular attention to microscopic pathology. Originally an adherent of the Natural History School, in which the microscope occupied an important position, he, in 1858, enunciated his docrine of cellular pathology—"*omnis cellula e cellula.*" The cell is the essential part, modified for the performance of different functions. "Every animal presents itself as the sum of vital unities, every one of which manifests all the characteristics of life. The characteristics and unity of life cannot be limited to any one particular spot in a highly developed organism, but are to be found only in the definite recurring structure which every individual element displays. Hence it follows that the structural composition of a body of considerable size, a so-called individual, always presents a kind of social arrangement of parts, an arrangement of a social kind, in which a number of individual existences are mutually dependent, but in such a way that every element has its own special action, and, even though it derive its stimulus to activity from other parts, yet alone effects the actual performance of its duties." In the cell resides the "vital force, nervous energy," etc., of preceding theories, instead of being an indefinite something existing in the body. The body is an association of co-related and reacting cells working in harmony with each other for the maintenance, regeneration and reproduction of the whole. The nucleus is the essential as regards maintenance and the reproduction of cells, and the contents, and even the intercellular substance,

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which is always under the control of the cell element, for function. For example the substance within the smooth muscle-cell produces the contractile force. From the action of the intercellular substance there arise cell territories, or districts of intercellular substance under the influence of a cell. The connective tissue is thus given an important position and constitutes one of the tissue groups of the body. These tissue groups are three in number; the first composed of cells alone (cellular tissue in modern sense); the second of cells of specific action (nervous, muscular apparatus, vessels and blood); and third the connective tissue characterized by the fact that in it "each cell is separated from the others by a certain intermedium." The cells of the latter are variously shaped and may anastomose. They form a third system of canals in the body, distinct from the blood and lymph systems. For the supply of a stream of lymph to parts deficient in capillaries, *e. g.*, bone, cartilage, tendons, cornea, etc., this is essential, because, according to his views, the vascular system is completely closed, no stomata in the vessel-wall being recognized. Nutrition is affected in the tissue elements by selection and attraction. "Thus an epidermic cell, a dense fiber or a cartilage cell, possesses an inherent capacity by which it can take from the nearest vessels (not directly, but frequently by a long process of transmission) certain qualities of material, proportional always to its special needs, to appropriate this material to its own use or otherwise, and possibly even to its own destruction."

In contrast to the Humoral pathology, which ascribed dyscrasiæ to the blood itself, the cellular pathology seeks the diseased organ which causes the dyscrasia. The blood changes are symptomatic and not the essence of the disease. Thus, Virchow gave as the origin of leukemia the spleen, lymphatic glands, or bone-marrow. On the other hand, he regarded the parenchymatous juice of cancer as the cause of metastasis, denying that the cells could be carried by the

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lymph-stream—a humoral idea. If the growth involved a vein-wall, the cells then might cause secondary deposits, but this was extremely rare.

In the pathology of pyemia he opposed that of Hunter and Cruveilhier. Hunter held that the noxious material was secreted by the vessel wall, and Cruveilhier that a capillary suppurative phlebitis with thrombosis always preceded the pus (which was fluid and free from cell elements), formed originally on the walls of the veins and by capillarity permeated the thrombus. Virchow believed that this pyemia was a pathological leucocytosis due to general glandular irritation. He taught that pus, *i. e.*, consisting of fluid and corpuscular elements, could never be absorbed into the blood unless a suppurative focus opened directly into a vein; that pyemia depends on the formation of a thrombus (local coagulation of fibrin) which, on softening, sets free the white blood-corpuscles in the blood stream, or a portion of thrombus may separate and give rise to embolism with metastatic inflammation. Where there is a diffuse gangrenous inflammation with pyemia he assumes a chemical mode of infection. "Here we have to deal with a transference of corrupted, ichorous juices into the body; and we must admit the existence of a dyscrasia (ichorous infection) in which this ichorous substance, which has made its way into the body, displays its effect in an acute form in the organs which have a special predilection for such matters." "These three different conditions may present themselves as complications one of the other, but do not necessarily coincide. If it be wished, therefore, to retain the term pyemia, let it be reserved for such complications as these, only we must not seek for a common central point, in a purulent infection of the blood, but the term must be regarded as a collective name for similar processes dissimilar in their nature."

Inflammation always results from an irritation, which is of such a nature as to cause changes in the composition of the

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part, and these changes render it less capable of performing its function. To this loss of function greater importance is attached than to the cardinal symptoms, redness, heat, pain, and swelling. The cell fails to perform its functions normally, the contractile power of muscles is changed, the secretion of the gland-cell and the irritation of the nerve. From this inflammatory irritation there is alteration of nutrition, so that primarily there is a change in their component parts, and secondarily in their altered condition they attract and absorb a larger quantity of material than usual and transform it according to circumstances. Two varieties of inflammation are recognized; a parenchymatous and secretory. In the parenchymatous the process seems to run its course within the tissue, there being no visible exudation of the fluid of the blood. Its tendency is to alter the histological structure of the organ and to lead to degeneration. In the secretory form, which attacks mucous and serous surfaces, there is an exudation derived from the membranes themselves. This removes noxious substances from the membranes and affords relief. Exudation of the blood-plasma is denied. Where a fibrinous exudation is found it is a product of the tissues themselves, just as mucus is of a mucous membrane.

Virchow ascribes the origin of all neoplasms to the connective tissue or its equivalents. The process of new formation consists of either simple division of cells where the cells correspond to the parent cell, or to their more rapid division and the formation of smaller and smaller elements until the structure of the original cell is lost. In the former case we have benign growths, and in the latter malignant.

These theories appear to have become obsolete, but in the modern pathology of to-day are not some of them present in a different form? Take, for example, serum-therapy, is not this a modified humoral theory? Its practical working has

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been demonstrated, but its mode of action is theoretical. Much of theory must remain in medical science until that which is called "life" becomes comprehensible.

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SHALL THE MANUFACTURER DO OUR PRESCRIBING?

BY G. J. KAUMHEIMER, M. D., OF MILWAUKEE.

When the medical historian of the future shall have occasion to review the reciprocal relations of medicine to its sister profession, Pharmacy, during the last quarter of the nineteenth century, a peculiar conditions of affairs will rivet his attention. On the one hand, he will find that pharmacy, as a profession, has made vast strides; schools of pharmacy have become numerous indeed; the possession of a diploma, or examination by a State Board, or even both, necessary to its practice; the processes and tests employed in the art wonderfully developed and its practitioners better fitted than ever to carry out in a conscientious manner, the directions of the physician in regard to the preparation of medicines. On the other hand he will find that there has arisen a tendency on the part of numerous members of the medical profession to use preparations of unknown, or partly known, composition, manufactured in a commercial way, and in a commercial manner, recommended for the most diverse and often contradictory array of diseases and foisted upon the attention of the profession by the persistent use of all the arts of the modern advertiser.

It has long been a cause of complaint, and to the writer's mind, a just one, by pharmacists, that too many medical men show a decided inclination to degrade the druggist to a purveyor of sundries and ready-made prescriptions, instead of allowing him proper scope for the exercise of the knowledge he has devoted much time to acquire.

The growth of this custom has been gradual, but comparatively rapid. Arising from the preference indicated by

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the prescriber to be given the goods of certain manufacturers on account of superior quality, it induced these manufacturers to offer to the physician compounds ready for dispensing, depending in great measure upon their previous good reputation for their introduction. The success of these led to a host of imitators, until to-day the greater part of the advertising pages of our medical journals and no inconsiderable part of the physicians' mail, is made up of puffs of various "indispensable" and "invaluable" mixtures. Besides this, a not inconsiderable portion of his time is taken up by the traveling agent, who wishes "just a moment" to introduce some new concoction. This has grown to be a decided evil, and in fostering it, medical men are aiding in pulling down their own profession.

It is a decidedly unscientific practice. The most of these compounds are made up of either very well-known drugs, in daily use among the profession, which knows their indications and limitations better than the manufacturer, or of drugs which the profession has known for a long time and has not found of sufficient value to use largely. Again, in the case of chemical compounds, which can be easily assayed, minor ingredients may be changed from time to time in order to allow the producer to deny each succeeding analysis as it appears.

A great many of these mixtures are prepared on the shotgun plan, with a variety of ammunition, very often antagonistic, to hit some kind of disease each time it is administered. A few choice examples, taken at random, may serve as illustrations: A remedy recommended for "rheumatism, neuralgia, gout, gravel, organic heart-disease (especially valvular disease), and kidney troubles," contains in each fifteen-drop dose, hyoscyamus, colchicum, bryonia, aconite, Magendie's solution, potass-iodid, gaultheria, cannabis, and cactus grandiflorus. Another, consisting of eight ingredients, is

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praised for every ill that woman is heir to, as well as increasing the force and lessening the pain of uterine contractions in labor.

A third, which is claimed to be simply a fluid extract of corn-silk, is stated to be "par excellence the remedy for nephritis, cystitis, urethritis, and for uric acid and phosphatic gravel, as well as useful for the removal of dropsical effusions," an association of therapeutic virtues the profession has hardly suspected in this homely product of our western farms.

These are isolated examples, picked out at random. A glance through the advertising pages of the journals will show many others. To such a stage had this usage come that the proprietors of a remedy advertised for fifty years to the laity, celebrated its semi-centennial by offering it to the medical profession as an anodyne expectorant.

That the use of such ready made cure-alls leads to loose and careless methods of diagnosis is evident, for what medical man cares to trouble his worried head about the pathology and exact nature of a case of uterine disease when he can write upon a prescription blank the magical name of a concoction which "is indicated in all abnormal conditions of the female system, without regard as to whether it is dysmenorrhea, menorrhagia, leucorrhea, amenorrhea, or any other functional wrong," as well as "aching back, bearing-down pains, or lumbar soreness," or when he can administer to a man a potion which will either increase the atrophied, or decrease the hypertrophied prostate gland, as may be needed, and cure incontinence or retention of urine with the unfailing regularity of a well-designed machine.

I have perhaps, given examples enough to show to what a strain the average manufacturer would put the physicians' credulity and patience. Indeed, many of the venders of these nostrums presume to instruct the physician in diagnosis, telling him how to elicit certain symptoms and then tell-

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ing him that the presence of such symptoms indicates the use of their particular preparations. There seems to be no objection even to the coining of new words, or the insertion of new diseases into nosology, if necessary to make the remedy a success. To cap all, an occasional "gentlemanly agent" will remark that he "had never found a first-class physician who did not use his nostrum."

Is it not time for the profession to assert itself and set these presuming merchants back into the proper place?

Many strenuous and specious arguments are advanced in regard to the great advantages as to purity of ingredients, accuracy, etc., of these compounds. However, we must take the advertiser's word for this, for as practicing physicians, we are not able, nor have we the time, to analyze these complex organic mixtures, whose chemistry is hardly known. Chemicals of all sorts can now be obtained of perfect purity at reasonable prices, so the claim of the use of C. P. chemicals, (with an organic admixture to obscure tests) falls to the ground. We may easier trust the knowledge, skill, and honesty of a pharmacist we know than that of an unknown chemical company in a far-off city.

The custom of prescribing these preparations is also inimical to the best interests of the medical profession in that it encourages self-medication and counter-prescribing. The cry is raised the druggists as a class are given to substitution, delivering to the patient whatever is in stock instead of what the physician prescribes. Hence the latter is urged to prescribe original packages, "name blown on the bottle." The obvious result of this is that the patient, knowing the name of the medicine, omits the next visit to the doctor and generously suggests the use of the preparation to his suffering neighbor, with the added recommendation "Dr. X. uses it." The druggist, to whom the so-called "literature" is as accessible as to the physician, hands it out over the counter. A number of preparations, at first "prepared for the profession

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only," are now more extensively exploited through the lay press than through medical journals, and almost all the popular ones are for sale at the bargain-counter of the department stores.

The expense to the patient, though somewhat of a secondary consideration, is considerable, because in general these nostrums cost more proportionately than extemporaneous prescriptions of similar strength, as the heavy advertising expenses must be paid at last by the consumer.

And now it will be asked, what is the proper remedy for all this? I answer: "A reasonable knowledge of the resources of our materia medica," together with that study of current medical literature which every progressive physician must undertake to keep up with the times, should enable any practitioner to intelligently prescribe drugs in combinations and doses properly adapted to the needs of the individual case, after a careful diagnosis, instead of mixtures compounded by the barrel-full for the cure of an entire chapter of a text-book on practice. Nor need palatability be neglected. The American Pharmaceutical Association gave its sanction, a few years ago, to a national formulary, comprising formulæ for combinations in common use, tested by experience and practical use by that body of able men.

The cure for substitution is simple. First be sure of your evidence, and then caution your patients against patronizing such a man, stating the cause. There are few druggists bold enough to continue this practice after once being detected and denounced.

Surely this is not too much to ask of the members of a profession to which the dearest interests of mankind are confided; that they exercise the necessary care to properly apply the remedy to the disease. And when we do this, we will learn more from our cases and be able to do more for them, and the manufacturer of drugs will be restricted to his own proper sphere, and will not try to usurp that of the physician by attempting to dictate to him what he shall prescribe.

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DIET AS A THERAPEUTIC AGENT.

BY KARL KORDENAT, M. D., OF REEDSBURG.

In order to clearly understand the term "*diet*," we must define it thus: that same is the food proper for invalids, or a selection or arrangement of such nutrition, *i. e.*, aliment, as is proper for the various requirements of the body.

Nutrition again is explained in a few words by saying, that this term indicates a series of processes by which the living organism as a whole, or its component parts, or organs, is maintained in its normal condition of life and growth.

Life, however, physiologically speaking, means, that all cells, whether single or united in tissues or organs, consume a certain amount of matter; that each tissue consumes its individual special aliment as necessary for its individual existence or physiological function. Our physiological doctrine teaches us how this is done, namely, that all cell-life is due and depending on the great *law of metabolism*, commonly speaking, the law of "change of substance." This law we know is subdivided into "*anabolism*," *i. e.*, the so-called upward building, the synthetical alteration, and the "*katabolism*," *i. e.*, the downward building, the retrogressive metabolism, the destructive or analytical alteration.

To preserve now a constant equilibrium in this law of metabolism, in other words to preserve health, and to restore the unity and harmony of all the vital organs, is the great end of all sound therapeutical philosophy, and as life, in the lauguage of Bichat, is the totality of those functions which resist death, so health is an expression of the harmony and unity of all the vital manifestations.

Disease therefore is but a suspension or aberation of one or more of these functions; therapeutics must consequently

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deal with the restoration and rectification of such suspensions and aberations.

To differentiate, however, in minute details between therapeutic agents *i. e.*, medicaments, and nutrition in this sense, is a task which I confess of being unable to do, as either one improperly employed or used, is capable of producing disease or at least pathological conditions, and on the contrary, if either of them is properly used will it remedy, *i. e.*, will have a curative effect upon disease.

The title and scope of this thesis do not permit me to enter broadcast into a more minute or complete description of dietetics, and I will restrict myself now principally to simply defining the *classification of foods* as such, and their *elementary composition.* Gilman Thompson divides food into six different groups viz.: 1, water; 2, salts; 3, proteids (chiefly albumenoids and the allied gelatins); 4, starches; 5, sugars; 6, fats and oils. This same author, speaking of the elementary composition of food in his "Practical Dietetics" says, that of the seventy-three elements existing and known, thirteen enter uniformly in the composition of the body, and that ten more are occasionally found in it, while several exist in small proportions and their uses are unknown. Some are found more abundantly, but are not indispensable to life, and certain elements, namely, C. H. O. and N. are *necessary ingredients* of the tissues of the body.

These elements form compounds which, as they occur in the various structures of the various tissues, have the following characteristics: first, although the elements are but few in number their molecular arrangement is very complex. Second, their compounds are comparatively unstable, and are readily converted in the body by chemical analysis into other forms. All foods are composed of combinations of these simpler chemical elements, which, for the most part, must be subjected to alteration in the body itself to prepare them for assimilation by the tissues. The nutrition of the body therefore

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involves several distinct processes, viz.: First, the secretion of digestive fluids and their action upon food in the alimentary canal. Second, the absorption of the ingredients of the food, when digested, into the blood and lymphatic vessels. Third, the assimilation of the absorbed nutritious products by the tissues. Fourth, the elimination of the waste material.

The three predominating elements, C. O. and H., are the great force-producers of the body, although they are tissue-formers as well, and to them must be added N. as serving in this double capacity, although its relation to tissue, form, action, and renewal is greater than its capacity for supplying energy. The common elements which enter into tissue-formation and which bear no direct relation to the main sources of the force-production in the body, are Cl. S. Ph. Fe. Na. K. Ca. and magnesium.

In order to determine now what particular diet, *i. e.*, what particular elements are required in health as well as in disease, we must, as physicians, familiarize ourselves with the diverse kinds of food as to their chemical composition, as well as to their physical properties, *i. e.*, their density, solubility, etc., so that we can administer them, principally on account of their chemical composition or constituents. As for instance: a lack of iron salts in the food would impoverish the coloring matter of the red blood-corpuscles on which they depend for their power of carrying oxygen to the tissues, and anemia and other disorders of deficient oxidation would result. A lack of sufficient potash salts, especially potassium carbonate and chloride, would likely cause scurvy. The lack of Na. Cl. interferes with many of the functions of the body immediately concerned with nutrition *i. e.*, absorption, secretion, etc., as it alters the density and reaction of the different fluids and consequently impedes osmosis.

Next to the matter of selecting the proper food as diet, are two more but equal points to deal with. First, the *proper*

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preparation for a speedy digestion; second, and of equal importance, is to constantly keep in mind the rapid, morbid decomposition of food, before as well as after ingestion. I refer to ptomain-poisoning, an intestinal putrid fermentation. That these difficulties are more prone with the animal food than with the vegetable kind, is too well-known to mention it here in detail.

As to the *selection of either animal or vegetable food*, permit me to state that no particular rule can be laid down as to which of either is suitable for an individual; as idiosyncrasy, temperament, race, age, sex, climate, occupation, etc., entirely govern the selection of them, but it must not be forgotten that errors of diet in general are far more common on the side of excessive meat-eating than on that of eating too much vegetable food, especially among civilized communities.

Nearly all authors on dietetics agree that the diet should be a *mixed one* in this sense. Thompson, Bauer, Voit, Letheby, and others state that one-fourth of animal to three-fourths of vegetable should be the normal average food for the healthy adult. An *exclusive meat diet*, or one entirely *vegetable*, should be avoided in the healthy, as the former is liable to stagnate the system with urates, phosphates, sulphates, and urea, producing, as mentioned before, scurvy, gouty diathesis, etc. On the other hand, an exclusive vegetable diet will result in loss of strength and a lessened resisting power against disease, a circumstance which we must not forget to consider constantly.

Guebler and other authors strongly believe that an exclusive vegetable diet eventually developes an atheromatous condition of the arteries, on account of the large proportion of mineral salts which thus enter the blood. It is also claimed that, for the same reason, a vegetable diet causes the deposition of phosphatic stone, gravel, etc., in the different parts of the body.

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In regard to an exclusive vegetarianism, it might be stated that such is, strictly speaking, not in existence practically, and is consequently absurd.

Concluding, I will endeavor to mention a *few general conditions* in which a *special diet* can be employed with more or less positively beneficial results. In all *acute or chronic diseases* the *liquid or semi-liquid* food is preferable to the more compact kind; the *latter* is only specifically indicated in *two diseases*, namely, in *dilation of the stomach*, in which condition Ewald recommends Schroth's dry diet (Trockenkur) as modified by Jurgensen; *and in obesity*, where a liquid diet is contraindicated on account of its great anabolistic property. In both these diseased conditions the diet should be a mixed one, *i. e.*, animal as well as vegetable.

The *therapeutic diet in obesity* may be summed up by saying, that as little liquid food as possible should be allowed; a rich nitrogenous, some carbohydrates, no sugar or starchy food, and of the vegetable, mainly that which grows overground, *i. e.*, herbaceous in nature, as for instance lettuce, turnip-tops, water-cress, endive, etc.

Leaving obesity I venture to take up the exact reverse condition, that of *leanness*, which certainly requires the exact reverse treatment to that of obesity. *Here liquid food* should predominate. (A phenomenal occurrence that often takes place with typhoid convalescences in regard to the "fatting up," is I think mainly due to the circumstance of the orthodox liquid diet to which these patients have been subjected for a long time.)

The theory to eat fat in order to produce fat, is not quite correct, as fat taken in excess does not necessarily cause fat to accumulate in the system, for it may be completely oxidized. *Other conditions* usually associated with leanness are those of maldigestion, dyspepsia, gastric catarrh, etc. Speaking of *dyspepsia*, Dr. Max Einhorn says in an essay read December 21, 1897, before the New York Academy of Medi-

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cine, in regard to the cure of dyspepsia, that medicaments are not of much value, or play but only a subordinate part, the main factor being in the proper nourishment. In order to improve the nutrition, two articles of food, *bread and butter*, play an important part. He claims that *white bread* constitutes one-third of the total ingested food in health, it also serves to increase the flow of saliva during its mastication, and creates appetite for other foods. *Butter* not only improves the taste of other foods, but it is also in itself a nutriment of the greatest importance, and more important than all this is the fact that this bread-and-butter diet removes, abolishes anorexia and sitophobia, *i. e.*, the fear of food in patients afflicted with the so-called nervous dyspepsia. The bread that is found to be the most suitable and recommendable kind is the crusty Vienna bread. It is not to be forgotten that too much mischief is done by the heavy sour bread which is so often found in use by dyspeptics. *In gastric diseases* where this organ is acutely or chronically afflicted and incapable of performing its functions, resort to *rectal alimentation* is in command. The articles which I have always employed were pancreatized meat and milk, and fresh ox-blood. These articles properly administered have always given entire satisfaction. The complaints that some physicians make, namely, that the injections are not retained by the patient are usually due to *four circumstances*, viz., the quantity is either too large; the temperature is much below or above 95° Fahrenheit; the predigestion is faulty or insufficient; or the method of injection, *i. e.*, so far as position of the patient and time of injection is concerned, is wrong.

One of the next most important conditions that heretofore required great consideration in dietetics, is *diabetes mellitus*. It is my opinion that the time is approaching where the orthodox proteid diet in this disease will be entirely abandoned, and a *mixed diet, i. e., proteid as well as carbohydrate, sugar, and starchy, will be* allowed to the patient.

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Dr. Edward L. Munson in an article on diabetes mellitus, published in the *Medical Journal*, May 8, 1897, makes a very scientific statement as to the results of an absolute proteid or a mixed diet, and says: "The restriction to an exclusive proteid diet resulted in the dimunition of the sugar excretion about one-half. This was accomplished at the expense of the general health and comfort of the patient, and was accompanied by the appearance and progressive increase of certain abnormal constituents of the urine which were of far more clinical significance than was sugar itself. A return to the mixed diet, in which a moderate amount of carbohydrates was allowed, resulted in the immediate physical and mental improvement of the patient, and decrease of the abnormal bodies in urine."

The diet in *rheumatic fever and chronic rheumatism.*

In the *former* the general diet as indicated in all acute fevers should be given; fluid food, milk, gruel, soups flavored with vegetables, chicken-tea, milk-toast, clam-broth. Farinaceous foods are contraindicated. For the thrist which so often is prominent, lemonade, acid drinks of various kinds, such as diluted phosporic acid or the effervescent mineral waters should be given. Alcoholic and saccharine liquids, however, are contraindicated. As to the diet in *chronic rheumatism*, little is to be said; especial attention is to be paid to the impoverished or anemic condition, and the diet consequently arranged. The *basis of the diet here, however*, must be farinaceous, with a liberal amount of fresh, green vegetables. Fish, eggs, and fowl may be eaten; sweets and alcoholic beverages should be omitted from the menu.

What is said of chronic rheumatism can also be said in regard to *rheumatoid arthritis*, only this condition requires that still more nitrogenous foods, such as roast-beef, beefsteak, mutton, etc., may be eaten.

Lyman recommends strongly as an adjunct to such diet, mustard and horse-radish, on account of their sulphur-con-

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taining properties. Alcoholics are not entirely contraindicated, and such as malt liquors, beer, ale, stout, Burgundy wine, port, or sherry wine often prove beneficial.

In *gout*, on account of the fact that this disease is mainly due to an *increased proteid metabolism*, a *proteid diet* must consequently be restricted, if not entirely prohibited. Sugars and gelatinous material like fats all tend to retard the complete combustion of proteid food, and should also be likewise rejected. *The proper* diet for this disease, then, would be a *vegetable kind*, although a moderate amount of meat and farinaceous food can be allowed; vegetables, however, which contain oxalic acid and which produce oxaluria (closely allied to uric acid), as sorrel, radishes, asparagus, rhubarb, tomatoes, and spinach, should be prohibited. The following are recommendable, French peas, young beans, string-beans, celery, young, tender corn, carrots, turnip-tops, parsnips, well-baked and mealy potatoes (except sweet potatoes), cucumbers, broccoli, beet-tops, and cauliflower, egg-plant, and artichokes.

Common salt should be allowed only sparingly, as it favors the deposition or crystalization of sodium biurate. Many authors also permit the different kinds of fruit, but disadvise strongly the use of strawberries and bananas.

In closing permit me to mention yet one diathesis in which diet is also of great therapeutic importance. *Although* that modern technical evolutions, *i. e.*, the scientific preservation of foods, have nearly annihilated scurvy, yet isolated cases occur. In treating this condition all we have to do is to *bring into the* system those ingredients which through their absence *have caused this* disease, namely, the salts whose diverse acids, citric, malic, lactic, acetic, and tartaric form carbonates. Consequently a liberal diet of vegetables, such as cabbage, sauerkraut, pickles, salads, watercress, or radishes, can be recognized as a therapeutic diet.

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OXYGEN AS A THERAPEUTIC AGENT.

BY WARREN B. HILL, M. D., OF MILWAUKEE.
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In the rational treatment of disease it is our aim to overcome the pathologic conditions present, remove some etiological factor, or to supply to the organism some element which is deficient. In this discourse it is the latter indication which we hope to meet. Of all the elements oxygen is perhaps the most essential to animal life; in a few diseases, the supply being deficient, it becomes a rational therapeutic agent.

In pneumonia some of the most pronounced symptoms are due to the lack of the oxygenization of the blood. The rapid heart is due partially to the over-stimulation of the cardiac nerve-centers by excess of carbonic acid; the pain and feeling of oppression are due almost solely to the effort of obtaining oxygen by a partially disabled respiratory apparatus. Heart-lesions, especially of the right heart, have a tendency to grow worse because of the over-exertion of that organ in its effort to maintain the pulmonary circulation. In these conditions oxygen is a most rational remedy.

Clinical experience has shown that inhalations of pure oxygen or highly oxygenized air promptly relieve the pain and oppression in pneumonia, reduce the number of pulse-beats and stimulate the heart to more perfect action, as well as materially reducing the temperature and probably diminishing the severity of the attack, if not cutting it short.

In dilatation, with or without valvular complications, in muscular insufficiency, this remedy also acts in a most beneficial manner. The high oxygen tension in the air-cells increases the aeration of the blood so materially that the heart is relieved of much of its burden, and that over-strained organ is enabled, by the reduction of the frequency of its beats,

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to recuperate, and instead of becoming progressively weaker, now becomes gradually stronger. The change is a natural one and necessarily very slow.

In laryngeal diphtheria the most alarming symptom is caused by stenosis, and the amount of air at each inspiration being materially lessened, it becomes necessary that the percentage of oxygen be materially increased. I believe that by the judicious use of oxygen, together with diphtheria antitoxin, that a very large percentage of the cases of this disastrous disease may be cured without the use of tracheotomy or intubation.

My attention, however, was recently called to another use for this remedy, in which its action is not so direct. I was treating a gentleman for hypertrophy with dilatation of the right heart, who was subject to regular and frequent attacks of rheumatism. I prescribed oxygen, and under its use the heart became gradually stronger. The treatment was continued for some months, and to my surprise he had no further attacks of rheumatism. This I attributed to the use of oxygen, as no other therapeutic agent was applied.

One of the accepted theories of rheumatism is that through lack of exercise or improper diet, or through some other condition present, the metabolism of the body is not completely carried out, and, as a result, we have urates, oxalates, and other sub-oxidized products of metabolism. These being incompletely eliminated, remain in the system and act as irritants, and possibly form a suitable nidus for the propagation of germs, which are believed by some to be the principal etiological factor in this disease. Acting upon this theory the administration of oxygen would overcome the conditions most apt to bring about this malady. I have only had an opportunity to use this remedy in a limited number of cases, but the results tend to confirm my convictions that oxygen is a valuable remedy in rheumatism and gout.

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ADMINISTRATION.

There are a number of ways in which oxygen may be procured. The electrical ozone machine is out of the reach of most practitioners and patients. In some localities we are able to procure oxygen in tanks, put up in the same way as nitrous oxid, with a little apparatus for gauging the amount that is taken. One can give inhalations of pure oxygen or oxygen mixed with air, and give as much or little as is deemed best for the patient.

There is another apparatus that had been devised for the administration of oxygen which is very cheap. The oxygen is freed by the union of permanganate of potash with peroxid of hydrogen. A small flask, divised for the purpose, is partially filled with hydrogen dioxid and tablets containing permanganate of potash are gradually added, the permanganate being transformed into the manganate, oxygen is set free as well as the extra molecule from the dioxid. This is inhaled by means of a tube which perforates the cork of the flask. Upon experiment it will be noticed that the oxygen so generated comes in the form of ozone, or active oxygen, which is believed to be much more potent than in any other form. This is a very simple apparatus, and the extremely low price of hydrogen dioxid at present brings it within the reach of our patients, even when used for a long time.

When tank-oxygen is used, if it is desired to have it in its more active form, the oxygen may be run through a volume of hydrogen dioxid, and the peculiar metallic taste of ozone may be discerned.

DISCUSSION.

Dr. Steele: Do you get practical results from the apparatus referred to, made by the Oakland Chemical Company, and the tablets—can you get sufficient oxygen from that little apparatus, using the permanganate tablets?

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Dr. Comfort: I have used the apparatus of the Oakland company to which the doctor has referred, and in one instance, in a case of tuberculosis pulmonalis in its last stage for which I had no hope, a marked improvement has been produced after using it about two or three weeks. I design to pursue this method of treatment with my patient further, and hope the results will be as favorable in the future as those that I have already attained.

Dr. Hill: In the case of rheumatism that I referred to, I used the tank-oxygen, but in several other cases I have used this little cheap apparatus of the Oakland company, and I have gotten good results from that apparatus, but I will say that I did not always use it according to directions. Instead of diluting the oxygen with water, as the circular directs, I used the pure peroxid and then instead of using a few tablets I used many. The amount of oxygen that is generated can be regulated by the amount of peroxid and the number of tablets that you use. By using them freely you get more of it.

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THE TREATMENT OF CHLOROSIS.

BY CARL R. FELD, M. D., LL. B., OF WATERTOWN.

As long as forty years ago, Felix Niemeyer, in his great book on "Special Pathology and Therapeutics," which was then a work of all-surpassing merit, and even now holds its place as one of the best text-books on the practice of medicine, outlined the successful treatment of chlorosis with large doses of iron. The preparation used by him, and to the correct use of which he attributed the rapid growth of his practice, was the old-fashioned Blaud's pill, containing sulphate of iron and carbonate of potassium. It has been my good fortune, during the last five years, to treat a large number of chlorotic patients, according to Niemeyer's method, with uniform success. My special attention was first drawn to the treatment of this common affection by the fact that quite a number of patients came to me who had been treated unsuccessfully, some for months, and some even for years, by other physicians. Upon questioning them I ascertained that they had all received iron in small doses combined with arsenic and other tonics, and that a great deal of attention had been paid to the digestive disturbances nearly always present in chlorosis, so that they had conceived the idea that the whole trouble originated in their stomachs. Having an old edition of Niemeyer, and reading the glowing account of his treatment of chlorosis with large doses of iron, I resolved to give this a thorough trial. My results with the first few cases were so surprisingly good, that I determined to keep a record of all patients so treated. What I have to offer to-day are the deductions from one hundred consecutive cases of chlorosis, all of which ended in recovery in a remarkably short time. In order to test the merits of a remedy, it is of the

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first importance to make a correct diagnosis, and I was therefore very careful to exclude all cases of secondary anemia, or beginning tuberculosis, and other grave constitutional disturbances. Iron is as much of a specific in chlorosis as quinin is in malaria, or mercury and iodid of potassium in syphilis.

The more certain you are of your diagnosis, the surer you may be of the success of your treatment. A failure to meet with success must always call to your mind the possibility of a diagnostic error. It happened to me repeatedly, when patients derived no benefit from iron, that I had to deal with cases of unrecognized secondary anemia, or grave constitutional disease. Two of these were cases of incipient tuberculosis, while one was a case of ulcer of the stomach. While iron in any form will do in chlorosis, and benefit may be expected of even small doses, the greatest good will be derived from such preparations of which large doses may be given. Of those, the aforementioned Blaud's pill takes the first rank. In my cases I have used only those, and exceptionally the *ferrum redactum*, when Blaud's pills caused distress to the stomach.

I never saw the need of resorting to any of the newer, more elegant, and more palatable preparations, with samples of which our pharmaceutical chemists are wont to supply us, nor did I find it advantageous to use the Pil. Chalybeate, advertised under the exact formula of Blaud's pill at forty cents per hundred, while Blaud's pill, pure and simple, is listed by the same firm at twenty-five cents per hundred. While it was formerly deemed essential to have the pills freshly prepared, clinical experience has demonstrated that age does not render them less effective, provided the pill mass does not get too hard. Except in the cases where Blaud's pills were not tolerated in the beginning, and *ferrum redactum* was resorted to in initial doses of three or four grains, I gave the former in five gr. pills, one three times a day, after meals,

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for three or four days, for the next three or four days two pills three times daily, then three pills, and often four or five pills three times a day, after meals, so that at last enormous doses of iron were taken. Under this dosage I have seen many of the most pronounced cases of chlorosis improve so rapidly in two or three weeks that they regarded themselves as fully and permanently cured, and would have discontinued all treatment but for my warning, that in order to avoid relapses, it would be necessary to take the pills for a period of at least three or four months. In most of my cases I gave in connection with the iron, arsenic in $\frac{1}{60}$ grain doses in combination with strychnin sulphate, often making use of a little tablet containing $\frac{1}{60}$ grain of the former, $\frac{1}{60}$ grain of the latter, and one grain of reduced iron. A combination of Blaud's pill with arsenic or strychnin is not desirable, as you would give too much of these remedies by increasing the dose of the iron. Of course not all of my patients received the maximum doses of iron mentioned. Many never exceeded two or three Blaud's pills after each meal, but I have always found that recovery was slow or fast according to the amount of iron taken. The largest doses, when tolerated, lead to the most rapid cures. Iron in combination with beta-naphthol has been found especially efficient in a number of cases, producing excellent effects and rapid progress, when iron alone acted too slowly. As next in importance to the iron preparations we must regard purgatives. Beside the various saline cathartics, those of vegetable origin, as aloes and cascara sagrada, will be found very useful. A favorite prescription of mine is Hooper's pill, which appears to act especially well in chlorotic subjects. As yet I have only mentioned those cases, and they constitute the greatest number under my observation, in which iron in the aforementioned forms was well borne from the start and throughout the treatment. Of course I have also met with those who could not take iron in any form, as well as those in whom a tolerance had to be established before it could be administered.

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Due regard to the condition of the gastric apparatus is always wise, though I believe we often lose valuable time by preparing the stomach too long before venturing upon a rigorous iron treatment. We are apt to forget that the stomach derangement is due to the very condition of the blood which we correct by giving it hemoglobin through the iron preparations. Thus we overlook the cause in treating the effect. It is always well to inquire whether the patient has a craving for acid food. If so, dilute hydrochloric acid in doses of from 15 to 30^{mm} after meals, or acid phosphate in somewhat larger doses, will often act like a charm and enable you to give first the *ferrum redactum* and later on Blaud's pill. I have had this experience in quite a number of my patients. An exclusive milk diet for a few days has also proved of much benefit. We must never forget that chlorosis generally occurs at a time when the greatest demands are made upon the system, the time of puberty. Hence, it is rational to look toward physical rest as a great aid in the treatment. While open air exercise is beneficial, it should never be carried to the point of exhaustion, and rest in bed should be had during a considerable portion of the day. Exertion under the influence of stimulants is especially harmful, as a reaction will surely follow. A safe rule to lay down is, never to take any more exercise than is possible without the least fatigue. Alcoholic stimulants are not often needed, producing an accumulation of fat which is objectionable in those who already have a superabundance of adipose tissue, which we find in many chlorotic patients. Lean patients, however, are often benefited by such tonics as rich wines, porter, stout, and good beer. Only the most nutritious food should be given. Milk and cream, when they are relished, are of great service and should be given in frequent doses during the day. All articles of food whose nutritive value is low must be abstained from, as they only keep the patient from eating suitable food. All these general hygienic and dietetic precautions help much toward

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producing early favorable results, but the majority of our patients either can not or will not take them. Fortunately, we have in the old-fashioned inorganic iron preparations such an excellent specific that in spite of the most unpropitious conditions and surroundings we can achieve brilliant results, provided we give them in large enough doses. The fact that in some few cases iron is not well borne has been made too important and is responsible for many a failure in the treatment of chlorosis. Shrewd manufacturers take advantage of this and create a market for their elegant, so-called physiological preparations, for the existence of which there is really no excuse. In prescribing them for our patients, or in dispensing them, we pay fancy prices for something which is in no way superior to the older and better known iron salts. Niemeyer, in whose practice Blaud's pills gained their first great renown, acknowledges that he does not deem them superior to other preparations of iron, but that their usefulness is due to the administration of very large doses. I am gratified to say that my experience has been the same, and, therefore, cannot speak too highly of this old-fashioned, rational treatment of chlorosis.

DISCUSSION.

Dr. Kaumheimer: I remember about eighteen years ago, while Dr. Senn was still a general practitioner, and when he was teaching us materia medica, he said, speaking of the Blaud's pill, "there is a prescription which you will probably carry two or three copies of in your vest pocket, ready to hand out." He used Blaud's pills in very large quantities, and although he used a very large number of iron preparations, always seemed to come back to them, and he invariably prescribed three 5-grain pills three times a day, and I remember of putting up as many as fifteen prescriptions for 100 each in one day at the time when he was still in general

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practice; and while he used a large number of iron prescriptions, prescribing at different times eighteen or twenty, yet he always came back to Blaud's pills in chlorosis and anemia. I frequently combine them with arsenic, or strychnia, or both, by ordering one grain of each to half an ounce each of the carbonate of iron and sulphate of potassium, divided into one hundred pills, so as to give one-one-hundredth of a grain to each dose; and otherwise I must say that I can endorse pretty nearly everything that Dr. Feld has said, although it is advantageous to have a freshly prepared pill.

Dr. Friend: In the use of Blaud's pills, we should attempt to get these pills freshly made so as to be sure that they are dissolved in the alimentary canal. Another very powerful adjunct in our treatment of chlorosis is the use of massage. Massage should be a routine practice. The administration of Blaud's pills and the use of massage increases the red blood-count about 1,000,000 corpuscles per week. It is the rule, not the exception, to have these results. Massage is given every day for one hour. Two weeks treatment will usually bring the red blood-corpuscles up to the normal count.

Dr. Feld: When I wrote this paper I thought of massage, but situated as I am, in a city where there is no masseur, I have not had the chance to try it. I suppose that excellent results might be gained by it. The principal thing I wish to impress upon the members of the Society is, that iron ought to be given in very large doses, and we ought not to be afraid of administering the inorganic preparations, which are in every way superior to the bland, non-irritating preparations, and that those who have not tried them, who have been afraid of the gastric disturbances, will be surprised if they start right in and give Blaud's pills, not in small but large doses. I have given more than I have mentioned in my paper, in exceptional cases.

As far as my statement about the freshly-made pills is concerned, I must say that I have tried both. I used to think

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that it was necessary always to have them freshly made, but I have used tablets three or four years old, that I could break up with my fingers, and have had the same success with them as with the freshly-made pills; and in looking over the literature on the subject I find that several investigators, or experimentors rather, have had the same result. The great advantage in using any kind of preparation, is cheapness, especially in the country, where you have to prescribe so many pills; and where they have to take them in such large numbers, of course it is quite an object to give something that does not cost much. It is an object to the physician if he dispenses his own medicines, and to the patient for whom he prescribes.

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THE EFFECTS OF STIMULATING NARCOTICS: A SOCIAL QUESTION.

BY JNO. MADDEN, M. D., OF MILWAUKEE.

I will not read a paper this morning, and my reason for not doing so is the fact that the subject is so large that it would be impossible to cover it in a paper of reasonable length, to be read here at this time. I have already written fifteen or twenty thousand words, but that is only a beginning. There is an immense amount of evidence to be analyzed. Of course under the title that you see in the program to-day, "The Effects of Stimulating Narcotics," I might confine myself to reading something, but it would be entirely unsatisfactory unless we made a basis for it by showing the effects of alcohol in different directions. When I began work in this direction I was unaware that the Committee of Fifty had already appointed sub-committees to investigate the same question. Perhaps you do not know that a Committee of Fifty, headed by President Seth Low, of Columbia University, have started out with the intention of thoroughly investigating the subject of alcohol. They have already published one volume which was partly written by Dr. Frederick H. Wines, of Springfield, Ill., and partly by Mr. John Koren. Dr. Bloomer, of Utica, is one of this sub-committee. I wrote to him asking him what evidence he had on the subject of alcohol, and he told me while he had an immense amount of evidence on the subject, that it was not yet analyzed, and that it would be some time before it would be put in print. The ethical side of alcohol was also given into the hands of a sub-committee of this same Committee of Fifty, and will be elaborated by them. My paper will, if it is completed, and I hope to complete it, be compiled in a moderate-sized volume, in which there will

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be an immense amount of evidence that has been gathered within the last five to ten years, and I hope that it will be evidence that we can rely upon, and that we shall know just what alcohol does, whether it be a stimulant or not, and how it stimulates; whether it be a food or not, and what the evidence is that would lead us to conclude that it was a food; the injury that it does when taken into the body as an irritant to all protoplasmic matter, and all other subjects relating to its poisonous effects.

Then we have the other narcotics, and principal among them, opium, which subject I propose to elaborate in the same way and compare them with the effect produced by alcohol.

That is all that I can say to you at the present time. I have already worked out the subject of alcohol as a stimulant and alcohol as a food. I can say that it is a matter of a good deal of surprise that the question of alcohol, whether it be a food or not, is not yet finally determined. It seems to be impossible that any two investigators should reach exactly the same conclusions upon the subject. I wrote one of our foremost teachers of chemical physiology in the United States, asking him what he thought about the matter, and he simply referred to the work of other men, saying that he had not himself investigated the matter.

The question as to whether alcohol is a food or not rests simply upon the fact that when it is ingested, only a certain portion of it may be recovered unchanged. That is, a part is eliminated by the skin, part through the lungs and part by the kidneys. There remains, however, a considerable amount that cannot be accounted for, and the conclusion is thereby reached that because it cannot all be again recovered unchanged that it must be burned up in the body. There are one or two facts which make this conclusion invalid. One of them is that heretofore investigators have gone on the theory that alcohol is eliminated very rapidly; that within a very

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few minutes after it has been ingested it begins to be eliminated, and that in the course of a few hours it is either burned up or eliminated; but the works of one investigator have shown that portions of alcohol are eliminated for a very long time after the last alcoholic drink has been ingested. In one case he found traces of alcohol eliminated six weeks after the last dose was taken, showing that while a large portion of alcohol might be eliminated promptly and rapidly, there still remained a considerable portion that was eliminated slowly; and why this remnant was eliminated more slowly than the rest we do not know; it may have entered into combination with some other tissues and finally been decomposed again and eliminated as alcohol. Now that, I say, is the evidence that alcohol is burned up in the body. We get no evidence of the increased products of alcoholic combustion. For instance, acetic acid and oxalic acid are not increased, neither is carbon dioxid. As a matter of fact the elimination of the latter is diminished with the ingestion of alcohol. This is true when even only a small portion of it is taken into the body. I tell you this simply to indicate some of the difficulties that we meet with in making an investigation of this kind. If the question were asked as to whether alcohol is a food, as to whether it is burned up in the body and therefore contributes anything in the way of physiological strength, I would say that the preponderance of evidence is on the other side.

There is another very important fact regarding alcohol, that is, it is an irritant and a narcotic. In that respect it is like chloroform, ether, paraldehyde, and urethane. Alcohol irritates the nerve protoplasm primarily; while its secondary effect is to narcotize. This irritation may be continued without reaching the height of narcotism until the protoplasm has actually broken down. Buckley, in two papers, one in the *American Journal of Insanity*, and the other in the *Glasgow Medical Journal*, discussed the matter fully, and he has said that the nerve changes, as he is able to show, in animals that

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died of alcoholism, were due directly to the irritating effect of alcohol itself, and not to the lack of nutrition, as some had suggested. I do not think it will be profitable, nor could I, if I wished to, give you a complete outline of the paper, because the future analysis of the facts that I have already in hand, will change that outline necessarily.

DISCUSSION.

Dr. Kaumheimer: There is no doubt that the profession will never agree as to the exact status of alcohol, either as a matter of daily use or as a drug. One portion of the profession believes it to be of extreme value and uses it very freely; others again deny even its value as a medicine. As to the great damage which is likely to be done by the general use of alcohol, I believe that its use is fraught with as much danger as the habitual use of opium or the habitual use of strychnia. But I was interested in what Dr. Madden says about the elimination of alcohol, that it sometimes takes six weeks to eliminate it from the system. It strikes me as rather strange with such an easily oxidizable agent that such should be the case, and it seems to me rather difficult to determine whether the alcohol eliminated at that time was not derived from some food ingested. We know that if we put fruit not fully ripe, in a glass jar, in a warm room and leave it there for some time and then remove the cover, we get a decidedly alcoholic odor. We also know that in some cases of gastric disturbance there is a decidedly alcoholic odor to the eructations, even if no alcohol has been taken, and it is quite possible that where a large amount of starchy or saccharine food has been taken, some of the alcohol eliminated six weeks afterwards may have been derived from that source from the decomposition of the carbohydrates. In regard to the question raised that the cafés in Europe make it a point, some of them, to charge a man less who drinks alcohol with his meals than one

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who does not; one reason is that they make more profit on the alcohol than on the meals, and another thing, a man who habitually uses it is likely to have a gastric catarrh and less appetite.

Dr. Madden: I am well aware of the fact that whenever the subject of alcohol is brought up it is liable to arouse an endless amount of discussion. Dr. Kaumheimer is of the opinion that perhaps the question never will be settled; but I think that we are on a fair way of knowing just exactly what alcohol will do when it is taken into the body. A great deal of work has been done in that direction within the last four or five years, a great deal of exact investigation, that gives exact results. Now, the first gentleman that spoke regarded anything as a food which prevented waste of tissue. That is not true. Morphin prevents waste, but it cannot be considered as food. Alcohol is said to prevent waste of tissue, simply because it hinders the oxidation and prevents the hemoglobin from giving up its carbon dioxid. It will not take up oxygen readily and will not part with its carbon dioxid. It prevents a waste at the expense of the tissue itself. It is well for the tissue to get rid of that broken-down matter as soon as it becomes a waste, and to get rid of it instantly. Otherwise it makes the tissue become non-resistant to disease influences. Alcohol prevents the elimination of broken-down products of carbon, but that does not constitute it a true food. If we speak of alcohol as being burnt up in the body, and contributing to the physiological strength, there is no evidence of that. Investigations show that the mind is less active after taking alcohol than before. It is the ego that is disturbed by the alcohol; and the man who thinks he is stimulated, simply deceives himself. I assure you that that is founded on exact investigation; it is not a matter of supposition or opinion, it is a matter of exact physiological experiment. I stated that the investigations of a certain man (whose name I do not recall,) found the process

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of elimination very slow after the greater part of the alcohol was eliminated; and I stated also that that might be due to the fact that the alcohol temporarily combined with some other product and was afterwards disassociated from the substance with which it temporarily combined. That is quite a common affair in physiological processes. We may have sugars changed to starches, and *vice versa*, in a body, without any difficulty, and that as a matter of fact this does take place. Whether alcohol enters into some part of the body to form a synthetic compound, and afterwards becomes disassociated, we do not know, but the fact remains that the alcohol is eliminated a long time after the last portion is ingested. The question was raised that alcohol might be produced by putrefaction of the starchy matters in the body. There are no normal processes that change either starch or sugar into alcohol within the body in appreciable quantities.

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ACUTE OSTEOMYELITIS.

BY H. A. SIFTON, M. D., OF MILWAUKEE.

Before the commencement of the last century no disease had been described which could be recognized as inflammation of bone. About that time Petit detailed a number of cases of acute inflammation of the long bones, which was undoubtedly what we now designate as acute osteomyelitis. A number of surgeons have since written on this disease under various names as osteitis, medullitis, endostitis and psuedo-rheumatism—until in 1834 the term osteomyelitis was suggested by Nelaton, from which time it has been usual to describe the disease under this title.

The first form of the disease to be recognized and described was the traumatic variety accompanying any form of injury to the bone. The relation of this form to so-called spontaneous inflammation of bone was not clearly understood until the days of Pasteur, since which time it has been known that they are one and the same disease, and are both due to pus-producing germs. The only difference is in the mode of introduction of the infecting material.

Recognizing then the fact that no matter in what form the disease may appear (it is always due to infection by one or more varieties of pus-producing germs), we have only to consider in our study of the etiology the mode of introduction and the resistance of the tissues to infection. The disease commences, as the name implies, in the medullary tissue and those bones which have the greatest amount, as the tibia and femur, are most frequently attacked. It usually begins near the ends of the bone where the cancellous structure is greatest.

It is much more frequent in children and young adults whose bones have relatively a larger amount of medullary

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substance than later in life. It commences near the epiphyseal line where new bone is formed, and the blood-vessels are undergoing change. This new growth of blood-vessels, together with the anatomical fact that the capillaries of the bone are in many instances larger than the arteries that supply them, and that in places they are devoid of walls, being rather channels in the cancellous structure, make the best possible conditions for the lodgment of pathological germs.

In the traumatic form in which there is an open wound, the infection is conveyed directly to the cancellous structure. But where there is no open wound it has been thought that in a few cases the channel of infection was through the lymphatics. This is difficult of demonstration, and probably not correct.

In the great majority of cases, perhaps all, the infection is carried through the medium of the blood-vessels. This is evidenced by the fact that the great majority of cases follow scarlet fever, diphtheria, typhoid fever, middle-ear suppuration, or other infective processes—the conditions in which we would expect to find infective germs in the blood.

As predisposing causes we have any condition which will lower the resisting power of the body, exposure to cold, poor food, bad ventilation, etc.

A clinical picture of acute osteomyelitis is the same as of any other acute suppurative inflammation modified by being surrounded by bone. This accounts for the excessive pain. Pain is one of the first symptoms, often appearing before the chill. It is of a peculiar excruciating, boring, throbbing character. It is always present except in cases of profound sepsis, in which the patient passes into stupor and collapse. It is usually not limited to the point of infection, but may be referred to a neighboring joint or throughout the whole length of the bone infected. In other words it may be referred to any part of the distribution of the nerve which supplies the point of disease. The pain will correspond with the amount

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of tension and seems at times to bear a relation with the height of temperature. As the tension increases, corresponding to the pouring out of the exudate, the pain increases, until the surrounding bone is perforated and the inflammatory products escape into the soft tissues, when it immediately becomes less.

The location of the pain should always be studied carefully, as it is one of our best guides to the point of disease.

Tenderness over the point of disease is always present and by its careful study we are enabled to locate the tissues involved. The point of greatest tenderness is where the disease is nearest the surface, and the place at which we open the bone in an early operation. Tenderness is seldom or never absent.

Swelling may be absent during the first few days of the disease, or until such time as the soft tissues become involved, when it extends very rapidly involving all the surrounding tissues, giving the feeling of deep-seated fluctuation. It is very liable to extend to tissues at a distance from the starting-point, even involving the whole limb. This is due to the direct involvement of the veins, producing thrombosis and extension along their channel.

In neglected cases the involvement of the soft tissues is often very extensive, separating the muscle-planes, and most frequent of all, separating the periosteum from the bone so that the entire shaft may be denuded and surrounded by pus.

Involvement of a neighboring joint may take place. It is liable to be simple in the early stages of the disease, while in the later stages it is more often septic and then becomes a very serious complication. The nearer the joint the original focus, the more danger there is of the joint becoming involved. The temperature is usually high in the commencement, showing great variation as it does in all acute suppurative processes.

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The pulse varies with the temperature, and is the best indication of the amount of infection, being rapid and weak when it is great, regardless of temperature.

The pathology of the disease has already been suggested, in that it attacks the long bones most frequently, but may attack any bone.

Beginning in the cancellous structure it quickly destroys the tissues involving all the structures, blood-vessels, nerves, and bone, extending in the path of least resistance, so that the entire central canal may be involved before it breaks through the more solid outer layers of the bone. When it does so it at once strips the periosteum from the bone, often to the entire extent, thus destroying the nutrition of the denuded portion, which dies and forms so-called sequestrum. The inflammatory material breaking through the periosteum involves the soft tissues, as before mentioned, and eventually opens on the surface, affording an exit for the pus.

If the patient has sufficient resisting power and develops immunity to the toxines of the disease, repair will begin and new bone form on the inner surface of the separated periosteum, forming a complete incasement to the necrosed portion, making the so-called involucrum, which is usually much more dense than ordinary bone, but is occasionally found to be porous with large cellular spaces. This involucre in time will become so strong as to bear the weight of the body, being perforated in one or more places, which correspond to the openings in the periosteum that afforded exit to the pus and communicates with the surface of the skin.

In a few cases the whole thickness of the bone will be destroyed before any new bone has formed, resulting in a so-called fracture. The necrosed bone lies in a cavity surrounded by granulations on the inner surface of the new bone.

In the majority of cases there is no difficulty in making a diagnosis if care is taken, but in a few cases with the greatest care mistakes are made.

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The septic condition induced by the disease is most likely to be mistaken for typhoid fever. So closely do they resemble each other at times that the most experienced have been mistaken, and the condition only made out on *post-mortem.*

When once a diagnosis is reached the same principles guide us as in all septic conditions. Remove all the infected material, if possible; if not give it free exit by drainage. In the majority of cases the process can be cut short by a timely operation. A case that would undoubtedly destroy the greater part of a long bone, and, perhaps, the patient's life, may be ended by the removal of a very limited amount of tissue. In such early operations, where there is only a limited amount of structure involved, repair will quickly take place and without damage to the functions of the bone affected.

But if destruction of bone is great, as in cases of long standing in which there is formed an extensive involucre surrounding a large piece of dead bone, perhaps the whole shaft of a long bone, the cavity, after removal of the diseased tissue, will be very large. If the large cavity is left to itself it will be long in filling up.

Many methods have been adopted to shorten this time, such as filling up the cavity with bone-chips. This would be of great value if the cavity could be made aseptic, which usually is not possible. Perhaps the most useful method is the covering of the floor of the cavity by a skin flap after healthy granulations have formed. Making an osteoplastic flap of one side of the involucre so as to displace it into the cavity has been tried, and in cases in which it is possible will give the best results.

The cases are very variable, and in each one the mechanical conditions must be met on its own merit.

A case which I present here may illustrate some of the points mentioned. His history is in brief as follows:

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About two years before he first came under observation he had what was undoubtedly an ordinary attack of osteomyelitis of the tibia, which, being neglected, after a time opened on the surface and continued to discharge from a number of sinuses. A short time before, his clavicle was attacked in the same way. A portion of the involucre which surrounded the tibia was incised and the entire shaft removed. No attempt was made to fill up the enormous cavity left. The dead bone in the clavicle and sternum was simply curetted away.

About six weeks after the operation on the leg, he had an acute attack of osteomyelitis affecting the humerus, which was at once opened and the diseased medullary structure removed. This cut short the attack without loss of substance more than about three inches of the cavity of the bone.

Some time later he had still another attack affecting one of his ribs, which was dealt with in the same way.

This ended the active manifestations of the disease.

In this case we have first to consider the result of neglect in the destruction of the long bone, the involvement of secondary centers which were promptly relieved by timely operations, and finally we see what nature can do in repairing and overcoming such a defect as was here manifested.

The cavity was nearly two years filling up.

DISCUSSION.

At the conclusion of the reading of this paper, Dr. Sifton exhibited patient referred to. Dr. Sifton said: The leg of the patient, (a boy of about 18), I would like to have you examine. This case is of particular interest to show what nature will accomplish when almost the entire shaft of the bone had disappeared. It is about four years since this boy was operated upon. At times he has had a bandage on his leg from the fact that the skin over the surface of it is liable to abrasions, but it is simply phenomenal to see how this cavity

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has filled up, and to notice the size and extent of the involucre that has formed. You can see here that the first incision was from one end to the other. You can see the extent and width of the new bone underneath, and how it has filled in without any attempt to fill up the cavity artificially.

In the arm operation there was no involvement of the skin, but we made a trephine opening about three and one-half inches below the great tuberosity and scraped out the medullary structure for about two and a half inches. There is practically no defect left in the arm. There was, however, quite a defect in the bone. We chiseled out a long path in the bone to get at the whole of the diseased structure. You can feel the opening in the bone now, and see where the skin is attached to the underlying bone over the cavity.

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REPORT OF CASE OF RECURRING MULTIPLE SARCOMA CURED BY CONTRACTING ERYSIPELAS.

BY P. O'KEEF, M. D., OF MENOMINEE, MICH.

On May 14, 1897, Mrs. H., aged 35, came to the hospital for the removal of sarcoma of left side of neck, left breast, and left axillary glands.

About two years before, she had her right breast and axillary glands and a small tumor over right scapula removed, and about two years previous to this again she submitted to an operation for the removal of a tumor from right side of neck.

The tumor of the neck I found very extensive, extending from lower border of jaw, external ear and mastoid process to and behind the clavicle. It was firmly fixed, and discharged through three sinuses, a yellowish, watery fluid, and the skin over a large portion of the tumor was adherent and had to be removed with the tumor. As a great deal of the dissection had to be made with the knife and the operation a very tedious one, more than two hours being required, there was necessarily a considerable loss of blood. Her condition did not warrant an attempt to remove the breast and axillary glands, as I promised her I should do if it did not prolong the operation too much.

She was, therefore, put in bed to wait for two or three weeks before completing the removal. On the second day after the operation, her temperature was 102½. The dressing was removed and the wound was found perfectly clean, but from the posterior edge of the wound for a distance of about three inches the skin was very red. I pronounced it iodoform dermatitis and changed the dressing, using borated gauze instead, and ordered a dose of phenacetin and quinin. Next day, however, the redness had extended over the whole of

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left back to lower end of scapula, and the temperature was 104°. I now diagnosed erysipelas, and put her on Tr. Ferri Mur. Stt. 20 and quinin gr. 4 every four hours. On the third day the eruption covered the right back from lower angle of scapula to shoulder. On the fifth and sixth day it extended down right arm, but had now disappeared on left scapula. Seventh and eighth days it extended over right chest, and ninth and tenth days covered left chest and arm. As the disease extended into new ground it faded from the earlier fields.

I supposed I had done with it now, as it had made a complete circuit of the chest and did not show any indication of extending downwards, but to my surprise, on the next day I found it again appearing over left scapula and it followed its original course around the body, taking about the same length of time to make the circuit. This course was followed four times in succession, continuing over a period of six weeks. The temperature during all this time was rarely 102°. A few times it reached 105°, but remained almost constantly a fraction above or below 104°. The quinin and iron were continued through the whole time in the same doses, and the patient supported on peptonoids, egg-nog, and any other food we could get her to take. She was in a precarious condition during all this period, but after the first ten days, I noticed a diminution in the size of the tumor in the breast, which was originally about the size of a hen's egg, and when the eruption finally disappeared, there was nothing left of it but a small dimple at the site of the tumor. The enlarged axillary glands had also disappeared, and in two weeks the patient left the hospital. She still remains free from any recurrence of the sarcoma.

What to me seemed peculiar about this attack was its long continuance and mode of travelling around the body, four times over the same ground, instead of extending, as the disease usually does, to new fields; also the continued high temperature maintained through its whole course, except during

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the last week, when it gradually dropped as the eruption disappeared, without advancing as before; and the limitation of the disease to the skin.

The subcutaneous tissues were never involved. It was throughout the entire course cutaneous; one would naturally expect that as infection must have entered at the wound, which was very deep, even the sheath of the large vessels being largely removed, that we would have had a phlegmonous form.

The infection resulted from putting the patient in a room lately vacated by a patient who had erysipelas. This I had no knowledge of at the time, or of course it would not have happened, but now I feel as though I would like to try it again. The streptococcus inoculation seems to be a failure. Is it because the disease thus produced is so modified that it does not produce a sufficiently high temperature, or is there a triple infection in natural erysipelas, the other coccus not yet discovered? And why did the disease in this case continue so long, and then only disappear when the sarcoma was destroyed?

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SURGICAL SHOCK.

BY A. H. LEVINGS, M. D., OF MILWAUKEE.

As general practitioners and surgeons, we can scarcely overestimate the importance of the subject of surgical shock, for it is well-known to play an important part in the mortality lists of every surgeon. It is a condition, which in a lesser or greater degree, attends every accident and every operation, and is always an element of danger and often the only danger. While in accidental surgery, the arrest of hemorrhage, where it exists, takes precedence of all other treatment, the consideration of the state of shock and its treatment comes next, and is, perhaps, of equal importance, while the deaths from shock probably equal, if they do not exceed the deaths from any other one cause.

During the year 1897, in a series of 150 major operations, I lost but two patients, and these two deaths were from shock. In the surgeon's work there are three dangers which are ever present, always active, and which must be kept constantly in mind. They are infection, shock, and hemorrhage, with shock probably of the three, the least under the control of the surgeon.

It is unfortunately no very uncommon occurrence, after a crushing injury or following a serious operation, even when but little blood has been lost, to see one's patient pass silently out to the other world from the effects of shock, despite our most strenuous efforts to the contrary. And it is a matter of no little surprise that a subject of so much importance, a state upon the proper treatment of which so many lives depend, should have received such scant recognition.

Surgical shock as a distinct entity, is comparatively of modern recognition. James Latta, in 1795, is said to have been the first to use the term shock, in the sense in which it is used

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to-day. Travers, senior surgeon to St. Thomas hospital, writing in 1826, says in substance, "That although death occurring from injuries to parts not essential to life, and following operations not esteemed hazardous, had not escaped observation, still the subject had received little or no attention up to that time." Guthrie speaks of the shock of the injury, and Sir Astley Cooper says: "The most severe injuries by shock to the nervous system may cause death without reaction." (Warren.)

In England, the subject of shock has received special attention, and among the surgeons who have devoted much time to it may be mentioned Travers, Jordan, and Savory.

In 1867, Billroth was the first in Germany to give especial attention to shock. About the same time, Blum, in France, devoted much time to its consideration.

Shock may be defined as a state of general vital depression, the result of an injury. The effects of shock are produced through and upon the nervous system; its most pronounced secondary effects being upon the circulatory system. The extent of shock is an indication of the person's nervous susceptibility; it is the nervous manifestation of injury to living tissue, and to an expression of the individual's inability to resist harmful influences from without.

The pathology of shock has been and is a subject concerning which there has been much discussion. It has been pretty generally held that shock was simply a functional disturbance, without a pathological basis, and leaving no demonstrable lesion after death. By some it was held that the nervous system was overwhelmed by a profound impression. Mansell Moullin defines shock as a reflex paralysis of the nervous system. In France, Blum explains shock as an arrest of the heart's action, due to reflex irritation of the pneumogastric nerve. In Germany many surgeons and writers have adopted the theory attributed to Fischer; namely, that the phenomena of shock are due to a reflex vasomotor paralysis, whereby

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the abdominal vessels are gorged with blood, and the brain, heart, and other organs, as well as the cutaneous surface, are anemic. Fischer takes the ground that shock produces a paralyzing effect upon the heart.

Boise claims that in general shock there is a hyperirritation of the entire sympathetic nervous system, occasioned by some sudden, and more or less violent impression, and causing contraction of the arterioles, by stimulation of the vasomotor nerves.

Goultz was of the opinion that in shock there was a very general vasomotor paralysis. The lack of tonicity of the abdominal vessels, arterial and venous, caused great quantities of blood to be received there, as occurs in division of the splanchnic nerve.

Groenigen, as described by Leyden, ascribes the phenomenon of shock to a powerful irritation, either directly upon the cord, or indirectly through a peripheral sensitive nerve, by which a profound molecular disturbance is produced in the nerve-tissue, which is thereby incapacitated from receiving less intense stimuli. The function of the cord may thus be paralyzed, or be reduced to a minimum. (Warren.)

Lutzenberger has recently made a very important contribution to the pathology of shock. He studied the microscopic changes occurring in the nervous system, following trauma to head or spinal column. In the ganglion cells situated in the general region about the site of the trauma, grave alterations are described. These consist, in general, of a sort of polar distribution of the chromatic substance. The rapid dislocation of the cerebro-spinal fluid could cause a laceration of the spinal cord, which would result in an alteration in the disposition of the white and the gray substances, simulating a heterotopia. Lutzenberger also states that in the spinal cord following trauma, sclerotic plaques are found, especially in places where the effects of the laceration have been most severe. Dilatation of the capillaries and of the veins is also

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present. In the medulla are found a great many cellular alterations. If the traumatism is followed by cachexia, the alterations of the cells are marked, and resemble those produced by grave pathological alterations of the brain, such as, for instance, those changes noted in general paresis.

C. Parascandola gives the result of a very extended series of observations on guinea pigs. He stretched the animals out flat by their feet, and gave them a sharp blow upon the abdomen with a flat ruler. The majority of the animals died after thirty-six to forty-eight hours with the symptoms of shock. The cerebrum, cerebellum, medulla, and cord were removed and preserved in appropriate fixatives, and studied by the Golgi, Marchi, and Nissl methods. The alterations found by the Golgi method consisted in a deformity of the cell-body, advancing to the grade of actual atrophy, node-like swellings on the dendrites and fragmentation of the same. By the Marchi method he noticed simple marginal degenerations of Lissauer's zone, and of the posterior roots proceeding to degeneration of the posterior columns. In some instances Gower's tract, the crossed, and the direct cerebellar tracts were involved, and sometimes there was a total degeneration of the entire cord.

By the Nissl method, the cytological alterations were various, but pronounced chromotolysis was present in a large number of cells. In those affected in a mild degree only, the chromotolysis was more peripheral than central. In the severer grades, the chromotolysis was complete. In a large number of the cells, peculiar abnormalities in the distributions of the chromophite granules were noted. These were peculiar, perinuclear, bonnet-shaped masses or fusiform, or like a crown about a rarefied perinuclear space. Further changes in the protoplasm were noted; verefaction going on to a vacuolization and to a total disappearance of the cytoplasm. Changes in a chromatic reticulum were noted. Changes in the nucleus were also observed. At times there was unimportant dislo-

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cation, but the greatest changes consisted in a vesicular swelling of the nuclear protoplasm, which varied to a notable degree. In some sections there were pronounced abnormalities in the colonition of the nucleus.—(*Medical Record.*)

From the foregoing it may be confidently asserted that in traumatic shock, we have an injury to the nervous system, which is always serious and often fatal; that traumatic shock is not simply a functional disturbance of the nervous system, through which the circulation is disturbed, but that its symptoms represent serious pathological change which can be demonstrated microscopically.

Probably some cases of syncope, due to blows upon the chest or abdomen and followed by death or recovery, and usually ascribed to shock, are caused by reflex paralysis of the heart and its abdominal vessels.

The course of shock is very variable. It may be so slight and evanescent as to represent nothing more than a slight confusion of ideas, a momentary insecurity, or be so severe as to be alarming, and result even in almost immediate death.

The course of shock is not only very variable, but it is easily influenced for better or worse by various conditions. The loss of blood, exposure, the administration of an anesthetic, infection, the two extremes of life, severe pain, or continued irritation, a susceptible, irritable temperament, anxiety, fear, despair, each and all favor or aggravate shock. In operative surgery, much may be done to mitigate or prevent subsequent shock. A patient about to undergo a serious operation should be put in the best possible condition, both physical and mental. This may be accomplished by suitable encouragement, and by attention to the gastro-intestinal canal, by frequent baths, rest in bed for a few days previous to the operation, and the administration of strychnin. For a considerable time I have had sphygmographic tracings of the pulse, taken for the purpose of determining the effect of shock, the loss of blood, and the action of drugs. These

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tracings were taken before, during, and after operations, by Miss. Nightingale, Superintendent of the Presbyterian Hospital. The treatment about to be outlined is based largely upon these tracings.

When the patient enters the operating room, various matters come up for consideration:

First, the anesthetic. The least possible amount should be given compatible with anesthesia. Ether producing less depression than chloroform, should under ordinary circumstances be preferred. If it is desirable to limit the anesthetic to the least possible amount, a quarter of a grain of morphin may be administered hypodermically just before the anesthetic. Morphin in moderate doses acts as a stimulant to the heart. The temperature of the operating room should be high, varying from 80° to 95° F., and the patient exposed as little as possible.

Coming to the operation, it should be done as quickly as possible compatible with good work. The least possible amount of blood should be lost. The life of many a patient hangs upon this tripod: small amount of anesthetic consumed, quickness of work, and control of hemorrhage. One should be prepared to meet complications as they arise. Ordinarily, $\frac{1}{80}$ of a grain of strychnin should be given with the anesthetic, and this can be repeated at short intervals if the pulse shows weakness. There is, perhaps, no drug to which the pulse so quickly responds as nitroglycerin given in $\frac{1}{50}$ of a grain hypodermatically. This dose may be repeated in thirty minutes, and after the second dose, every two hours. Whisky, that newly acquired anesthetic, the amber liquid which has stood the test of generations, but which has of late been so much abused and almost banished from the operating-room; in my practice, when given subcutaneously or by the stomach, increases the force and fullness and lessens the frequency of a pulse laboring under shock. Tr. digitalis, or digitalin, may occasionally be used to advantage. An enema of hot coffee

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and milk is of great service in lessening shock. Hot water-bags or bottles should never be forgotten, as they help to restore the normal body-temperature. The infusion of a normal salt-solution is of the greatest service in cases where much blood has been lost. Kola seems to have a future as a heart-tonic, and probably will be of service in warding off shock as well as in supporting the heart after the occurrence.

If the surgeon have the means at hand for the prevention and treatment of shock, and is watchful and quick to act, he will succeed in saving many lives which otherwise would be lost.

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FRACTURES OF THE LOWER END OF THE HUMERUS.

BY W. A. BATCHELOR, M. D., OF MILWAUKEE.

It goes without saying that the treatment of fractures is a matter which greatly concerns every one of us, whether as surgeons or as general practitioners; and yet when we review the progress of our art during the present generation we are most forcibly impressed by the development of the operative side of surgical practice; and with all our great activity in extending the field of surgical interference by operation, and in perfecting our treatment of wounds, there has not been a corresponding zeal shown in the attempts to deal more satisfactorily with simple fractures.

I wish, then, to discuss for a few moments the treatment of fractures about the elbow—more particularly of fractures of the lower end of the humerus. I am conscious that what I shall have to say is not original in the sense of being new, and that what I may say will be listened to and judged by many who have had far better opportunities than I for estimating its truth and worth. I wish to collect and review some of the more recent plans of treatment, and to draw what practical conclusions I can. I wish, too, that my presentation of this subject might draw out from our members a discussion which I know would be of value, for after all "experience teaches"—the practical results are the final tests. And right here, as I try to recall what I have learned and unlearned by experience, I wish to introduce a parenthetical paragraph to the younger members of our body—I am not old nor overburdened with the weight of experience, but I am old enough to know that what experience I have would be of vastly more worth to me, and possibly to others if it could have been

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fixed and recorded—my counsel then, is, *keep notes* of all or nearly all your cases—cases of pneumonia, cases of pleurisy, cases of typhoid, cases of obstetrics, cases of fractures—they will be of use to you and of use to your patients in more ways than I now have time to specify.

Fractures of the lower end of the humerus are among the commonest of accidents—in my experience I believe the commonest of fractures, with the possible exception of fractures of the clavicle. I remember not long ago having five under my care at one time—this I can say of no other fracture. I fancy, too, that the fracture of no other bone gives the surgeon more uneasiness, and in regard to no other is he more cautious in his prognosis, and more than any other fractures do their results involve the surgeon in legal difficulties. The elder Gross has said that he knew of no fracture which he approached with more doubt and misgiving.

It is not my purpose nor is it necessary to go into details of the anatomy of the elbow-joint nor specify the symptoms of, and various causes of, fracture of the lower end of the humerus. The fractures, however, with which we are most concerned are: transverse fractures involving the condyles—the one that is occasionally mistaken for a dislocation backwards of the forearm; the same fracture complicated with a fracture between the condyles and extending into the joint, and third, the fracture of the internal condyle, the broken off fragment including all or most all of the trochlear surface for articulation with the ulna. These, I take it, are the commonest and most troublesome. The diagnosis of the fracture is certainly the most important step in the intelligent management of a case, and it should be as accurate and as definite as possible. In *all* cases I prefer to give an anesthetic, and insist upon it when there may be doubt as to the nature of the injury, when there is much swelling, or when, as is so often the case with children, fright and pain preclude a careful examination of the joint.

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But even with anesthesia the diagnosis is not always easy —at all events not for me.

The best resource is, of course, a clear and definite knowledge of the anatomy of the parts; but even to the best anatomist I presume the subject is fraught with some anxiety. Our anatomy is learned, chiefly and necessarily, from normal structures, not from broken bones, contused muscles, and swollen joints. I wish to refer here to a practical point which may be new to some of my hearers. I have it from an article by Dawbarn in the *New York Polyclinic* for *July 15, '97*, and Dawbarn says that he got it from Gerster years before. The point, applicable particularly to cases seen some time after the accident has happened and in which the swelling of the elbow prevents any thing like a satisfactory examination, is, briefly, this: under anesthesia apply a rubber bandage from the fingers slowly, firmly, evenly up over swollen elbow to axilla, leave it on fifteen minutes, then remove, beginning at the hand and leaving the final few turns in place on the upper arm. The elbow thus exposed—I quote from Dawbarn—"will be pale, bloodless, and no longer swollen. * * * The diagnosis can now be made with comparative ease." I have never tried this, but I believe it to be worth speaking of and that it will occasionally be useful. Dawbarn says that he has repeatedly been thankful for a knowledge of it.

The X-Ray and the fluorescent screen is another presumably useful aid in the diagnosis of these fractures, although probably to remain for a long time the luxury of few. Our main dependence must be the intelligent and penetrating vision of our finger-tips.

Passing without further detail to the subject of dressing to be applied in the treatment of these fractures, there is what appears to be a distressing lack of uniformity in the teaching and practice of able and experienced men.

One man in a case of supracondyloid or intercondyloid fracture, puts the arm in a straight splint of pasteboard, felt,

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or tin, in the position of complete extension and supination, and begins passive motion in forty-eight hours—"on the second day redress and flex and rotate the arm twice; the work of redressing and passive motion must be continued with scrupulous fidelity for many weeks," says one prominent surgeon; another confines the joint at a right angle in a plaster-of-Paris dressing for four or five weeks without passive motion; another dresses in the position of extreme flexion and without any splint to the joint, and all of them talk about their fine results, and in a number of cases so large that their talk can hardly be disregarded. In such diversity of good advice where is the safe way?

The two things which all methods strive to attain are, first, a perfect or normal power of flexion and extension, and second, the preservation of the natural angle between the axes of the arm and forearm, as seen when the arm is held in the position of extreme extension and supination—the natural crookedness of the arm which enables you to carry a bucket of water without striking it against your knee.

Treatment in the extended position is said to be as old as Hippocrates, who mentions and very vigorously condemns it. In recent years the method has been worked out, and advised as early as 1861 by Coulon, of Paris, and later by Bardenheuer, in Germany, and in this country by Allis, of Philadelphia, and to-day the method is recommended by a goodly proportion of surgeons, not in fractures of the internal condyle only, but in all fractures at the base of the humerus. The plan finds its chief recommendation, I think, in the fact that the normal obliquity of the forearm can thus be preserved more perfectly. The objections to the plan are that the swelling of the dependent hand is sometimes very painful, and there is occasionally a marked tendency to a tilting forward and displacement of the fragment—the internal condyle. That this treatment in the extended position does not prevent anchylosis is well shown in a report of ten cases by

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Jarvis Wright, professor of surgery in the Long Island College Hospital. (*Annals of Surgery, Vol. XVIII.*) Ten cases are reported which had been treated in complete, or nearly complete, extension, and with a resulting firm anchylosis, making the results as unsatisfactory as any attained by the older methods. Five of these cases were treated by resection, four by infraction, and one was let alone.

One of the best showings that I know of for the treatment in the right-angled position, is a paper by Chas. A. Powers in the *New York Medical Record, Vol 34.* This paper was published in 1888, and from what one sees and hears of Powers since then, I believe that his statements are to be respected as honest and intelligent. He details fifty cases, with results on the whole admirable. His method briefly, is accurate diagnosis, accurate replacement of fragments, and fixation at a right angle for about four weeks in plaster-of-Paris. His results, too, are a very satisfactory refutation of the idea that early passive motion is necessary to the securing of good joint function.

Of the method of treatment in extreme flexion, I first find notice in the *British Medical Journal* for 1894, by Mr. Robt. Jones, of Liverpool, who states that he has made use of the method for many years. The method has been used and recommended in this country by H. L. Smith, of Boston (*Boston Medical and Surgical Journal, 1895*), and by Chas. H. Frazier, of Philadelphia, *University Medical Magazine, 1898.*

From the articles here referred to, I think the method has some features to recommend it—personally I have never made use of it, as I have of the other two methods. Mr. Jones, of Liverpool, has reported the very respectable number of two hundred and fifty cases. Smith, of Boston, made a number of experiments on the dead body to determine "at what degree of flexion of the forearm the fragments were held in the best position." Among other conclusions he states that the fragments, (in these artificially produced fractures,) are held most

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firmly in place if the elbow is tightly flexed; the next best position in this regard is the position of forced extension (not loose extension,) while the greatest mobility is met with at 100° of extension; and also that the *essential factors* in the locking or fixing of the fragments in this position of acute flexion seem to be the coronoid process in front, and the ligamentous and muscular structures behind. Practically carried out the procedure is to diagnose and reduce the fracture and fix the hand of the affected arm upon the shoulder or clavicle of the opposite side. Jones slings the arm to a rubber or leather collar around the neck. Frazier has devised a very satisfactory dressing which consists of an armless jacket of canvas or duck, laced up on one side with a mit sewed on to secure the hand. The mit is open on the back and laced to secure the hand firmly. This dressing permits the early use of massage, which is becoming an important factor in the modern treatment of fractures and sprains. Daily massage is recommended and may be used within the first week. Passive motion is easily employed if deemed desirable. Frazier recommends its early use. Jones opposes its use until the stage of consolidation is past. The reported results of treatment as stated above are very satisfactory. It seems to me that in some cases a word of caution might not be out of place as to the possibility of injury to the ulnar nerve by this forced flexion, but the caution may be unnecessary.

In conclusion, from my study of this subject and from my personal experience in a considerable number of cases, I feel that I can emphasize two or three points—first, take time in making a diagnosis, it is never regretted, and take plenty of time in making a careful reduction of the fracture; second, I believe, with Frazier and Jarvis Wright, that too much importance has been attached to the "carrying angle," it should not be entirely ignored however, and after reduction of fragments is made, the two extended arms should be compared when any deviation from the normal obliquity of the forearm

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shows that the fragments are not properly replaced; third, I believe, with Stimson, that "the ankylophopia of the surgeon is more dangerous to the patient than the traumatism." I think there is a growing tendency to delay passive motion and that there is a greater degree of uniformity upon this subject than upon the subject of splints and positions; and, fourthly, I believe that there are some cases in which some deformity and some limitation of motion are simply inevitable by whatever method treated, but I also believe that such cases are less frequent now than they were a generation ago.

DISCUSSION.

Dr. Chandler, of Milwaukee: In speaking of these fractures and saying that we must depend upon manual examination to put them in place, and correct deformity, I would say I have seen one case in the last six or seven months where the fracture to all intents and purposes was in excellent position, where there was no deformity whatever that you could make out, yet the X-Ray showed a decided deformity. The fracture was just above the condyle. Four months after the picture was taken, the deformity was much reduced and the arm is good and serviceable to-day.

Another thing, in all our dressings regarding fractures of the elbow they do not speak about confining the hand; they say, apply the dressing as far as the wrist. I think it would be better to take our dressings and confine the hand temporarily at least, for ten days or two weeks, and then it can have passive motion. The only dressing where we find the hand confined is in the dressing at strongly flexed position, the canvas dressing Dr. Batchelor spoke of; but we should confine the hand for at least ten days or two weeks.

Dr. Batchelor: Dr. Levings has remarked that this is evidently not a meeting prone to discussion. I fancied that with a subject so common as elbow-fractures it would be a lit-

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tle as it is with diphtheria, that everybody would have a theory and everybody would have his experience to relate. However, it is all right I presume.

I shall merely refer to Dr. Chandler's point, which I think is a good one. The motion of the fingers and hand of course would disturb the bones at the other end of the flexors and extensors. Our dressings include the confinement of the hand, but oftentimes you see them where the hand is not confined, and it is well enough to bear that in mind. I would like to hear if any one has had any experience in this method of extreme flexion. I have been a little taken by the description of it and the published results, but I never remember seeing a case treated in that manner. Most of mine have been treated at, or a little within a right angle. I have treated one or two cases in extension but the flexion I have never tried, although I mean to do so.

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THE GENERAL PRACTITIONER AND THE SURGEON.

BY T. C. MALONE, M. D., OF MILWAUKEE.

A few years ago each doctor thought it his duty to announce himself a "Physician and Surgeon." Such signs are rarely met with now-a-days, and, when seen, usually bear the marks of age.

The great advance made in all departments of medicine seems to have emphasized the distinction between the physician and the surgeon, and, while there may be doubts as to the need of some of the other specialists, no one questions the need of these two great classes of workers. The last few years have almost completely revolutionized the science and art of surgery. The surgeon of to-day works under conditions scarcely dreamed of fifty years ago. He is almost complete master of the situation. Science places at his disposal means for controlling his patient during his work and for controlling the healing process following. Little or nothing is left to chance. This has wonderfully increased the field of surgery. Operations are now performed upon the most vital organs; every region of the body is now explored with impunity, thus enabling the surgeon to relieve many conditions which seemed to be incurable under the old methods of treatment.

Internal medicine, too, has made equally rapid strides; increased knowledge of the cause of disease has brought new and improved methods of preventing and treating the same, so that we are compelled to forget much of what was taught us less than a quarter of a century ago, and learn the new. These facts make it almost impossible for any one to keep up with the times and be a good physician and an expert safe surgeon. Can the general practitioner be expected to do so?

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Can he endure the slavery of his work, be an ever-ready, earnest, and safe physician, and do good work as a surgeon? He is certainly a very exceptional man who can do so; the field is too large, the requirements are too varied, and this seems to be accepted as a fact by his patrons. While the family doctor is supposed to know everything, and be able to advise the proper course of treatment in any given case, he is not expected to do much surgery. If he attempts any of the graver surgical operations his work is looked upon with suspicion. They seem to think it scarcely possible for him to do the best work, and we believe they are usually right. Again, when the doctor gains a reputation as a surgeon, he is very apt not to be considered a safe physician. Sick people are usually afraid of him; he is too ready with the knife.

There are great inducements for the young doctor to become a surgeon; honors and large fees await those who make a success of it. Many yield to these temptations and await with impatience the opportunity to do surgical work. They are ever ready to advise and undertake the gravest operative procedures. In order to obtain the consent of the patient, they promise great and ofttimes impossible results; they promise relief perfect and lasting. It is not so very long ago, you remember, since an ovariotomy would cure everything from backache to insanity, and quite regardless of the condition of the ovary itself. With them every pain in the abdomen is an appendicitis and demands an immediate operation. They remove the ovaries and uterus as often as they can find patients ready to submit to the operation. They do everything to prove to the public that they are surgeons and not afraid to cut, and we believe that this has been the cause of much reckless and very unnecessary operating within the last few years, and it has brought much discredit upon surgery in general. Poor judgment in the selection of cases and faulty technique will quite certainly give a large death-rate. While we know that much of this unnecessary surgical

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work is being done on the pelvic organs of women, we believe that there is scarcely any region of the body exempt. A surgical procedure to be satisfactory and a credit to surgery, must be a success—it must accomplish something. Not only must the patient live, he must be benefited; the promised relief must be obtained. If the results are not all that were promised, not only will the operator be censured, but the operation will be condemned. Every failure works harm to surgery. It often requires good judgment, coupled with experience, to decide in a given case whether an operation will succeed or not. In a case necessarily fatal it is usually not wise to operate, as surgery is quite certain to get the credit of the death. The success or failure of many operations is decided by the methods of the operator. We believe that appendicitis has now a larger death-rate than it had before it was considered a surgical disease. We believe this is, in great measure, due to the fact that the operation is often done unnecessarily, it is done at improper times, and in an improper manner, because it is so often done by those not skilled in that particular kind of work. We feel that this death-rate will be materially decreased when the operation is always done by the expert surgeon. This is true of other diseases as well.

Recognizing the fact that it is always the duty of the physician to do that which is for the greatest good of his patient, it becomes very frequently his duty to call to his assistance the surgeon. He should always call him in time, and call one able to give the very best possible help.

The increased power of the surgeon increases greatly his responsibility. Being able to so completely control the progress of his cases he should, in a great measure, be held responsible for the results, therefore it is all the more necessary that he be capable, careful, and conservative. Important organs, whether located in the pelvis or in any other region of the body, should never be removed when not absolutely

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necessary. It may be easier at times to remove an organ or a member than to so improve its condition that it ceases to be a source of discomfort or of danger to life, but which is the more desirable result? Which should be the source of greater honor to the operator? The time has come, we think, when long lists of organs removed by this or that route should cease to be a credit to the surgeon. He should be called upon in every case to defend such removal, to prove that the ablated organ was a source of positive danger and could in no other way be remedied. We repeat, that no organ or portion of the body should be sacrificed when it is possible to preserve it. A finger saved is better, far better, than a hand removed. When a portion of the ovary is healthy it should be preserved; the healthy ovary should not be removed. The uterus should not be sacrificed simply because the woman has passed the child-bearing age and some ambitious surgeon, or some statistic-builder needs the case.

That some one in Europe has succeeded in removing the stomach without immediately killing his patient should not be considered good and sufficient reason for repeating the operation in this country.

It is often possible to determine that growths in and about the breast, as well as other parts of the body, are not malignant, and thus avoid the more extensive operation and consequent disfigurement. Our patients should get the benefit of our increased knowledge and of our perfection in methods of diagnosis; our mission is to preserve and not to destroy.

In conclusion, we believe that the great increase in the fields of both medicine and surgery make it scarcely possible for any one to do good work in both departments; that it becomes the duty of the physician much more frequently than formerly, to call to his assistance the surgeon; that he should always call him in time; that, when possible, the major surgical operation should always be done by the skilled operator who should be held responsible for results, and that the surgeon should, at all times, be the most conservative of men.

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THE MEDICAL TREATMENT OF VARICOSE ULCERS.

BY G. A. HEIDNER, M. D., OF WEST BEND.

I will preface my remarks on this subject by saying that *all* varicose ulcers are curable, and that nearly all of them are curable without any radical surgical measures. My reason for selecting this apparently threadbare subject for a short consideration at this time is that in my judgment it has been shamefully neglected by the general practitioner, to whom it is of such vital importance.

Without aiming to cast reflections upon any one I wish to state that in my practice during the last ten years I have treated a great many varicose ulcers in middle-aged and old people, some of them having been previously treated by many physicians, both regulars and irregulars, besides the almost numberless applications which had been suggested by kind neighbors, and I will frankly confess that these, more than any other class of curable patients, have tested my ability to hold them long enough to get the desired result. Please bear this one fact in your mind when considering one of these chronic and discouraged cases, that unless you can get the confidence of your patient and have the unrestricted management of the case for a sufficient time, you will save yourself trouble, and deprive the patient of a great opportunity to say unpleasant things against you—by having nothing to do with the case.

Our text-books on surgery and dermatology treat this subject in a general way, outlining the fundamental principles which govern the treatment. These suggestions are very good as far as they go. It is necessary, however, to go into the minutest detail in the application of these principles, or

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we will meet with many dismal failures in practice. The *patient* must be made to feel the importance of carrying out the treatment in all its details. This accomplished, more than half the battle has been won. You can readily see the force of this statement when you consider that in the country, at least, most of the actual treatment is done by the patient.

Now let us consider a few of the principles that must govern the treatment in every case of ulcer that is dependent upon varicose veins for its existence. First, the vessels of the leg must be supported and, second, the ulcer itself must be stimulated. Without these the reparation process cannot take place. It would be a comparatively easy matter to cure a large majority of these ulcers if we could get the patients to go to bed for three or four weeks. In fact, I believe many would heal without any treatment except simple cleanliness. Unfortunately, however, most of these ulcers occur in elderly people who are found in the humbler walks of life, and either from circumstances or from a disposition to move about, it is impossible to keep them off from their feet. With these patients we are obliged to devise means to support the venous circulation while they are moving around doing their ordinary work, and in my judgment our success or failure in each individual case can be predicted by the manner in which this part of the treatment is carried out.

Given a case, we first determine the condition of the circulation in the limb, *i. e.*, swelling, pain, a heavy feeling, etc., then the condition of the ulcer itself, whether active and granulating, or foul and indolent. These are the factors which determine the treatment regardless of the duration of the case. In every case with swelling of any consequence, I deem bandaging absolutely indispensable, unless the patient can be induced to keep the foot elevated to allow the blood to gravitate toward the body. By bandaging, I mean supporting the circulation, not merely a bandage to retain the dressings in place. I prefer the woven web, elastic bandage,

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about two and one-half inches wide of medium weight. In mild cases a flannel bandage cut bias about the same width, answers very well. I have entirely discarded the elastic stocking except for after-treatment. The most valid objection to a stocking of this kind is that it never fits the case, even if it should fit the leg. By that I mean that when the stocking is new it causes more pressure than the patient is able to bear, and later when a greater degree of pressure could be endured—and is desirable—the web of the stocking relaxes, and exactly the opposite to what we are aiming at occurs. Too much care cannot be observed in applying the bandage. For the average case a bandage twelve feet long is sufficient. In applying it, begin at the ball of the great toe and make successive turns around the foot until the maleoli are reached, then take one turn around the leg above the ankle, coming back over the instep to make one more turn to cover the ankle as completely as possible, after which continue the turns around the leg until the knee is reached, using first the simple spiral, then the reverse spiral, and finishing with the simple spiral turns. When properly applied the web bandage is not very apt to slip. I usually lap the bandage about one-half of its width in each successive turn, exercising the utmost care to obtain equal tension throughout its entire length, so as to completely support the veins and prevent edema. Never forget to demonstrate every detail of this part of the dressing to your patient at the first consultation, even if it should be necessary to apply it yourself several times. Also insist on it, that it must be worn constantly day and night, or put on the first thing upon rising in the morning, should the patient prefer to wear some more simple bandage during the night to retain the dressings.

As a result of improper treatment or uncleanliness, many of these ulcers are presented to us in a very foul and indolent condition. The surrounding integument is covered with a profusely weeping eczema, which has kept the patient in mis-

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ery perhaps for weeks or months, and for the relief of which our help is sought, often more especially than for the ulcer itself. Allow me to digress here and say that some of these patients will tell you that they do not care to have the ulcer healed because Mrs. Brown had one healed last year and she died. Formerly the profession taught that doctrine but they do not accept it now. I wish to record myself as one who believes that we have here a good opportunity to render our patients much more comfortable, and prolong their lives as well, by curing their infirmities. Our ability to hold the patient long enough to treat the ulcer successfully depends largely upon our success with the eczema.

Given a case, the first thing to be done is to clean the base of the ulcer as thoroughly as possible with good soap and water if necessary. If it is indolent apply tincture of iodin, or some other mild caustic on a small wisp of absorbent cotton. Wipe it dry and apply a little of the following powder: calomel, iodoform, and acetanilid, equal parts. This is applied to the base of the ulcer only; care being taken to brush it all away if any should get on the surrounding skin. If this precaution is not observed a more or less severe eczema will almost certainly follow. Over the powder apply a piece of sterilized gauze covered by absorbent cotton protected by oiled silk or non-absorbent cotton and apply the bandage as I have already directed. If the base of the ulcer is covered with healthy granulations, a less stimulating application will be better borne. As such I use iodoform or acetanilid one part and boric acid seven parts; when, as occasionally happens, the ulcer is exceedingly painful, a little morphin or cocain may be added with benefit. A slippery-elm poultice may be used for a few days with good results in some cases. In case hypergranulation tissue is present it must be destroyed by caustics or a curet. Powdered alum has served me well in a few mild cases. Ordinarily the dressings should be changed every evening at first and less frequently as the discharges de-

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crease. In a few rare cases it may be necessary to change them twice daily for a few days, otherwise the discharges will irritate the skin. After a few iodoform dressings some patients will develop a general erythema and other symptoms of iodoform poisoning. In others calomel will be found to be too irritating. Where neither of these can be borne I have learned to depend on acetanilid.

For the acute eczema so often accompanying these ulcers, I have used various applications, the most satisfactory of which consists of kaolin 15 grams, oxid of zinc 12 grams, linseed oil 15 c. c., solution of subacetate of lead 12 c. c. Mix the kaolin and oxid of zinc and the solution of lead, then add the linseed oil immediately and mix thoroughly in a mortar. This makes, when properly prepared, a very smooth paste. It should be kept in a wide-mouthed bottle, well corked to prevent evaporation. This paste should be thinly applied with the finger or a small brush. Unless applied too thickly it will dry in fifteen minutes. By dusting a little finely powdered oxid of zinc over the application it can be dried even more quickly. The bandage must not be applied before the paste is dry. These applications need not be made oftener than the ulcer is dressed. If there has been much oozing, the paste will have been detached from the skin, and can be easily removed. Those parts which are adherent should not be disturbed, but all that is loose must be removed and a new coat applied as before. Unless it is absolutely necessary for cleanliness, the affected parts should not be washed. Water irritates the delicate skin and increases the oozing. Treatment must be continued until pigmentation has occurred. It ought not to be necessary to remind you that the general health of our patient must be looked after. If necessary, provide for proper elimination and tone up the system. These patients will all be grateful to you after they are well, but most of them will not believe all you tell them until they are well. Donbtless there are many other remedies which can be locally

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applied with results equally as good as those which I have detailed. Some others may be even better, but the general principles upon which I have placed so much stress must be the basis for all our treatment.

DISCUSSION.

Dr. Helm: I would like to speak of a method I have followed out for two years. I have seen this method used in the practice of Phelps, of New York. He used adhesive strips in all cases, beginning with the base of the toes and following up clear to the knee, and he expects to cure his cases in two or three weeks. He uses no dressing to keep the parts clean, but if the ulcer is very tender, he puts lead plaster over it and changes dressings every four to six days.

Dr. Batchelor: I sometimes think I have had a good deal of experience in treating sore legs. The gentleman who just preceded me, remarking about the application of adhesive plaster, states that he leaves it on for how many days?

Dr. Helm: From four to seven days.

Dr. Batchelor: I have seen cases that I have covered with adhesive plaster two or three days, and at the end of that time they have a lot of pus under the plaster, and redness and soreness of the skin around the ulcer, and the patient would complain, and I would regret having left my dressing on for that length of time. I was simply wondering if you or Dr. Phelps met with difficulties of that sort.

Dr. Helm: I have used it in varicose ulcer cases complicated by eczema which were very irritating and accompanied with great itching. I apply the lead plaster wherever the irritation is present. At the time of the removal of the first dressing there may be a large discharge, but at the removal of the second dressing very little, and at the time of the removal of the third, often none at all. The eczema disappears at the end of the second dressing, and the itching at the end of twenty-four hours.

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Dr. Batchelor: I have treated many such cases, and have had apparently fair success with them. If I was to say in a few words what I depend upon, it would be a bandage from the toes to the knee, well-fitted and snugly applied, and the dressings changed every day or every other day. Further than that, surgical cleanliness is essential. I very frequently make use of adhesive plaster in this way: around the edges of a deep ulcer there will form this little ridge of scar-tissue that has to be absorbed and made level with the floor of the ulcer before healing will take place. Around that edge you may apply narrow strips of adhesive plaster built around in two or three layers, somewhat as a child makes cob houses. Outside of that I sometimes strap down the leg with strips of adhesive plaster, and then a bandage over all, from the toes up, to control the blood supply, etc., and you will find that absorption will take place with a fair degree of rapidity. I do not know that I always cure my patients in from two to three weeks, although some of them I do cure in that length of time, but here and there cases occur that have taken longer; but the pressure and cleanliness, I fancy, are the main points. I have had one excellent good result in the largest ulcer that I ever healed, that measured four inches in one direction and four and a half inches in the other, oval-shaped, and that from the following procedure: I simply, with the patient under anesthetic, scraped off all the granulation tissue clear down to the fascia, and then scorched it lightly with a Paquelin cautery, and I was surprised to find how quickly the ulcer closed over under the application off a moist boracic acid dressing. It did beautifully after the unsuccessful trial for a considerable length of time, of other methods. I think that is the only time I tried the scraping process, but it is a good thing to use in a large, stubborn ulcer.

Dr. Lewis: Put the patient to bed until the ulcer heals and then put the bandage on and keep the foot elevated, and

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the ulcer will heal itself unless there is some calloused condition that might require particular treatment.

Dr. Comfort: I have been deeply interested in this very familiar subject that comes under the observation of every practitioner. When I first graduated I used to treat leg ulcers as we were taught by Dr. Gross, of Philadelphia, by cauterizing them and destroying the young granular tissue as it occurs. We were wont to cauterize them with nitrate of silver, strap them, bandage them, and paint tincture of iodin upon them, etc. After practising it for a number of years, I made up my mind that it was not the best course to pursue in these cases. I recollect a case that came under my observation, in which the soft tissue had all sloughed away from the anterior aspect of the tibia, the bone was completely denuded, and amputation had been recommended, but the patient absolutely refused. I saw but one way out of it, and that I resorted to. It required a long time to treat the case, a number of months. I cannot see how these cases can be cured in one, two, or three weeks, as has just been stated—chronic ulcers of this kind I mean. The plan I adopted in that case was to resort to the application of Labarraque's solution, about ten per cent., diminishing it to five per cent. as healthy action of the tissues seemed to manifest itself. This is an old remedy which has passed comparatively out of use, but Labarraque himself, like the framers of the constitution of the United States, builded better than he knew. He devised a bactericide that is pronounced by Sternberg equal if not superior to any bactericide that we now have.

When I was first assigned to duty at the Soldiers' Home, every morning I would see ranged before me, some thirty or forty old men with varicose veins and ulcers, who came up to have their legs dressed in that manner. Some were dressed every day, and others about every second or third day, under the direction of the surgeon. They were cauterized with nitrate of silver, painted with iodin, they were

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strapped, and they were bandaged with common muslin bandages. That treatment had been resorted to for years, probably, and without material benefit, and there were ulcers of ten or fifteen years standing, or longer, which were being so treated. This was a problem I had confronting me when I first commenced my duty there. I ordered an application of Labarraque's solution, about ten per cent. of its pharmaceutical strength to those ulcers on a compress of absorbent cotton—oakum I used then, because oakum was issued to us; it was then used in the regular army and was kept constantly on our shelves. I think it is found now to be a nidus for microbes—oakum or surgeon's tow was always issued then—it has passed out of use and other dressings have taken the place of it at present, but this was the application I made. The affected limb was bandaged over the compress, and after using Labarraque's solution as stated, men would meet me on the parade ground and thank me for the treatment which I had recommended in their cases, and in about two months almost all those forty or fifty cases were cured, and the number that appear now at surgeon's call is probably, or possibly, ten, when it used to be forty or fifty. Nitrate of silver, iodin, and strapping, I found to be unnecessary. When the tissues become edematous, as they not unfrequently do, I have found a Martin's bandage useful; this is a rubber bandage, which used to be issued to us in the army, and I think it is yet. Some medical officers used to say: "There is Martin's bandage, yes, but nobody has had any success with it except Martin himself." It is a thin rubber bandage about twice or three times the thickness of an ordinary sheet of paper, and about two and one-half or three inches in width. This is applied from the toes to the knee, and is probably twelve feet long. It does not require the reverse, as other bandages do in their application, but requires to be overlapped about one-half its width at each portion, and it can be washed and cleaned. It has no fabric surrounding it to

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become uncleanly like the rubber stocking. We have but few leg ulcers now at the Home, where they used to exist in hosts.

Dr. N. M. Dodson: I wish to mention a method taught me many years ago by a former member of this Society, namely, by strapping. I refer to Dr. Chapman, of Madison. I never saw him fail to cure a case in four or five weeks, and I have seldom failed myself when I used the same method. The strapping must be done with the resin plaster and never with the rubber. I think the resin plaster has a stimulating effect that helps in the cure. The bandaging is important. He taught me to use, and used himself, if there was the everted hardened edge about the ulcer, citrine ointment, or a little calomel. This was done when there was an unhealthy condition. In strapping with the plasters, the plasters extended about the leg so as to admit some motion of the skin. The plasters were laid on somewhat like shingles on a house. At the lower edge of the ulcer a little opening was left to allow the discharge of any matter that might be formed, but very little pus would be formed, and when properly dressed it was seldom necessary, as could be determined by the stain on the bandages, to remove the bandages under four or five days. It would be astonishing to see the amount of healing and how much the ulcer had diminished in size, in removing the bandages and plasters, which were left on for four or five days, then removed and the ulcer dressed again. When it is practicable I ask the patient to lie down and keep his foot elevated, but I seldom find anyone willing to submit to the horizontal position, and, as I say, I hardly ever fail to cure them in four or five weeks, without insisting on a horizontal position.

Dr. Heidner: I do not know that I have much to say in closing this discussion. I have been pleased with the interest some of the members have taken in this subject. I wish others might take an interest in it also. I should judge th a

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the members of this Society take more interest in treating ulcers than some other members of the medical profession, and I reach that conclusion from the number of cases that have come to me from physicians who ought to have cured them but failed to do so, because I consider that their cure is one of the easiest things in the world, under proper treatment.

The adhesive plaster is only one way of treating these cases. Curetting under an anesthetic could only be necessary in extreme cases, such as Dr. Batchelor has mentioned. I have curetted in a few cases, but it is quite painful. I never gave an anesthetic for this purpose. The principle that is involved in all these cases is, to support the circulation above all other things. Do that and the majority of the ulcers will get well without any other treatment. Keep them clean and support the circulation. But there are some cases that will not get well under that treatment, that is, the ulcer is in such condition that it requires stimulation and pretty powerful stimulation. As far as applying the iodin is concerned, I never do that except as a stimulating treatment.

One of the members mentioned that iodoform would cure almost every case, and I think that he is correct; but there are a great many patients who will not bear iodoform, at least that has been my experience, and I have succeeded by its use in scaring some of my patients nearly to death, and I frankly admit that it scared me a little too. The Martin bandage I used formerly altogether, but I have altogether discarded it because the majority of the patients complain quite severely of the burning that it produces; the perspiration not being allowed to escape, the bandage would be wet in the evening and the ulcers would not do as well under that bandaging as they will under the web bandage which allows evaporation of the moisture.

Dr. Comfort: The Martin bandage is applied over muslin bandage. The Martin bandage applied next to the skin will excoriate.

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CYSTIC KIDNEY.

BY DWIGHT MERENESS, M. D., OF MILWAUKEE.

Professor of Anatomy, Milwaukee Medical College; Pathologist to the Milwaukee County Hospital; Surgeon to the Johnson Emergency Hospital.

Cystic kidney proper, or total cystic degeneration of the kidney, is the pathological condition to which we are limited in this paper. We mention, merely to exclude them, small cystic kidneys, characterized by small cysts, none being larger than a small marble, and usually limited to the cortex, and occurring as the result of chronic interstititial inflammation. The large, solitary cyst, occuring in otherwise healthy kidneys, as well as echinococcus cysts, hydronephrosis, and pyonephrosis must also be excluded.

In true polycystic kidney the entire renal substance, cortex and medulla alike, are crowded with cysts varying in size from the microscopical to those holding perhaps a pint of fluid, although cysts as large as this are seldom found. The most common size of the large ones is that of a walnut. The cyst-contents vary in color and specific gravity according to the quantity of blood, pigments, fat, cholesterin, urinary salts, or products of degeneration present. It may be clear and limpid in some, and viscid and turbid in other cysts of the same kidney. The cysts are found to be lined with epithelium as a rule, but in the larger ones it may be absent. The intercystic tissue is often the seat of chronic interstitial inflammation, but usually contains some quite normal renal parenchyma, although it may be difficult to discern with the unaided eye. The increase in the size of the organ is great, although the general form of the kidney is more or less preserved. Such kidneys often measure eight or ten inches in length, and weigh two to three pounds each. One placed on record by Hare in 1850, weighed sixteen pounds and meas-

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ured 15¼ inches in length. Cystic kidneys may be congenital or acquired, and may be unilateral, although they are usually bilateral. They are said to be congenital when found in the new-born, and may, on account of their size, seriously interfere with parturition, or death may ensue soon after birth from intra-abdominal pressure or renal insufficiency. If the disease is palpable at birth, the life of the infant is always short. All writers are agreed as to the theoretical probability of congenital cystic changes, of mild form, persisting latently into middle life, or even old age. Some observers deny altogether the acquired form of the disease, for cystic kidney of the adult, or old age, differs in no essential as to histological structure or cyst-contents from the congenital, except the degree of the chronic inflammation of the extra-cystic parenchyma.

Hektoen divides the explanations offered by investigators of the genesis of cystic kidney into three classes, namely, (*a*) the retention cyst, (*b*) the cyst adenomatous, and (*c*) the teratoid theories.

(*a*) Various causes of obstruction of the uriniferous tubules have actually been demonstrated in the cystic kidney of the new-born as well as in the adult. Some of the causes of the occlusions are by impaction of casts, desquamated epithelium, blood-corpuscles, and precipitated urinary salts. Virchow assumed a papillary atresia or stenosis due to fetal inflammation as the cause of congenital cystic kidney.

(*b*) Adenomata of the kidney are usually solid tumors, but the cyst-adenomatous theory is based upon the appearance characteristic of adenomata found in the cystic kidney. Papillary excrescences have been observed in the interior of the cysts. These and the proliferating epithelium of the uriniferous tubules, are believed to be allied to true adenomatous changes. However, in the majority of cases the epithelium appears to be entirely passive.

(*c*) Persistent embryonic rudiments are regarded by some

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as the cause of cystic kidney. Remnants of the Wolffian body, scattered through the normal renal tissue, are supposed to develop into cysts. Shattuck and Bland-Sutton adopt this theory. It is fair to notice in this connection that associated with cystic kidney are often found other anomalies of development, as horseshoe kidney, those without pelvis or ureters, and also hydrocephalus and monstrosity. The same mother has given birth to several children with cystic kidney. The frequent simultaneous occurrence of the cysts of the liver with the cystic kidney, Lejars having reported seventeen out of sixty-three such cases, as well as the anomalies of development just mentioned, impress one with the plausibility of this theory.

It is tenable that all cystic kidneys do not arise from a common pathological condition. Thus the acquired form, if there be such, in which the epithelial lining of the cysts is entirely quiescent or often absent, may be reasonably attributed to occlusion and retention, dependent upon chronic interstitial nephritis. Those in which the cysts or tubules present a demonstrable proliferating epithelium, with new cyst-formation by budding from an old cyst or from the uriniferous tubules, are undoubtedly examples of cyst-adenomata.

The congenitally developed cystic kidney is most reasonably explained by the theory of imperfect differential development of the embryonic body. It is theoretically consistent that in the same kidney both the embryonic developmental, and the acquired inflammatory, processes may have operated together. Adult subjects of this disease are more often males, in the proportion of three to one. Death more often occurs between 40 and 50 years of age, although it has occurred in recorded cases at all ages up to 98.

Cystic kidney is, as a rule, discovered upon *post-mortem* examination only. There are not more than five recorded cases of verified *ante-mortem* diagnoses. Stiller, who verified his by operation in 1886, considers it more a lucky guess than a

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scientifically elaborated diagnosis. The clinical history is usually that of chronic interstitial nephritis, although dropsy very seldom occurs and albumen does not, as a rule, appear in the urine until late, and may then be small in amount or be absent altogether. Often the first indication of the disease is a sudden fatal attack of uremia. Casts in the urine are, as a rule, few, and are often entirely absent. In two-thirds of the recorded cases hematuria is present at irregular intervals. Frequent and painful micturition with tenesmus of the bladder have been noticed in several cases. The pathognomonic feature of the disease is the bilateral tumors in the renal region, which are very seldom found during the patient's life. If the tumor is unilateral, the difficulty of the diagnosis is increased. Cystic kidney has often been discovered in operations based upon erroneous diagnosis but very rarely has the removal been preceded by a correct diagnosis. Probably the first nephrectomy performed in the United States was done in this State in 1855 or 1856 by Dr. E. B. Wolcott, of this city. Dr. Wolcott never published the case. I am told it was one of cystic kidney, although this was not what he expected to find. As an instance of cystic kidney found upon operation and removed, I desire to report somewhat in detail the following case:

Mrs. C. H., age 38, widow. Family history good upon maternal side. Her father and all his family died of tuberculosis. She has two brothers and three sisters living and in good health. One sister died at thirteen of "quick consumption" and one brother at four of "sunstroke." Her childhood was uneventful except that she had scarlet fever at nine years and recovered without complications, except a fever sore on the leg which discharged three years and was then "cured by a salve." She was very active as a child but was never injured although she frequently fell from trees and was often thrown from horses. She menstruated at eleven and was married at sixteen, had an abortion soon after marriage and

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her first child at full term was born when Mrs. H. was eighteen. Altogether she had borne five children at full term and had four abortions. The last pregnancy was seven years ago. She had "fever and inflammation" following parturition three times and was always unable to urinate voluntarily after childbirth and it was necessary to catheterize her for a week or more each time. These were the only times when she had any trouble which she referred to the urinary tract except more recently when she has had attacks of frequent and painful micturition and has noticed the occasional appearance of blood in her urine. She has never had any pain or tenderness in the lumbar region. Two years ago she began to have attacks of pain and distress in the right side of the abdomen which lasted from six to twenty-four hours, during which time she suffered indescribably and became delirious and feverish. The onset of these attacks was sudden, usually beginning with weakness and dizziness. The pain, which she describes as drawing and tearing, would soon begin and nothing but large opiates would bring relief. During the attack the patient says she could scarcely draw her breath. After each seizure she was completely prostrated and was confined to her bed two or three weeks each time. The pain did not recur after it once ceased, but the tenderness over the right side of the abdomen was so great for several days that she could not endure the weight of the bed-clothes. During the attack she states that the urine became thick and streaked with blood, and was passed with difficulty. She suffered four such attacks during the last two years, several months intervening each time. Each one came on after some hard work or great exertion. Three months ago she placed herself in charge of Dr. J. J. McGovern while sick with inflammatory rheumatism which lasted nine weeks. The urine was repeatedly examined during this time with negative results, except overacidity and occasionally a little blood. She was much annoyed at this time by tenesmus of the bladder and fre-

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quent and painful urination. Three weeks ago, while taking a Turkish bath, her attention was attracted for the first time to a tumor in the right side of the abdomen. It seemed to grow quite rapidly and when I saw her in consultation one week before operation it appeared to be as large as a child's head at birth. It was located in the right side of the abdomen close to the median line, and mostly below the meridian of the umbilicus. It was more freely movable upwards than downwards. Upon palpation it gave the impression of a very tense cyst of regular globular form, but upon percussion it was found to be tympanitic over a part of its area due to overlying intestine, as was afterwards shown. Diagnosis was reserved, with the probabilities pointing to ovarian cyst.

Operation was advised and accepted, and on June 6, 1897, assisted by Drs. McGovern and O'Malley, at the Wisconsin General Hospital, I removed this cystic kidney. The tumor, which was bulging the abdominal wall, was found to be a large cyst attached near the lower pole of the kidney and to its internal border. It was very tense and held by estimate at the time fully one pint of fluid, which was as clear as a crystal. It was necessary to empty the cyst before proceeding with the operation. After patiently enucleating the kidney, I was able to bring it entirely outside the abdominal incision before ligating the pedicle. The patient made an uneventful recovery and was discharged July 3d. Since the operation she has never had any pain or trouble of any kind in the abdomen. While she is not strong she has been active ever since and reports appetite and digestion good and sleep normal. She complains more or less of rheumatic pains and at times still has vesical irritation.

A recent analysis of her urine is reported as follows:

Color, slightly cloudy and smoky. Reaction, slightly alkaline. Sp. gr. 1018. Albumen, a trace; sugar, none.

The microscope shows small amount of blood and pus—no casts nor crystals.

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Her abdomen is flat and the walls thin, but a most careful examination fails to detect any enlargement or abnormality of the left kidney. The gross appearance of the tumor removed is as follows: It weighs two pounds without the contents of the largest cyst, which had a capacity of one pint. This is a larger cyst than has ever been recorded as being found in connection with a true cystic kidney. The measurements of the kidney, not taking into consideration the large cyst, are: length eight, width four, and thickness two and one-half inches. The general kidney form is retained. There are about fifteen cysts of the average size of an English walnut, while the number of smaller ones cannot be estimated. At the time of removal all the superficial cysts were fully distended, and their walls tense and shining. The contents of the smaller cysts differ altogether from those of the larger one, for while the latter were clear and sparkling, the former are viscid and cloudy, and in some of them bloody in appearance. No chemical analysis of the contents was made.

Sections from a part of this kidney which seems most nearly normal to the unaided eye were prepared, and present the following appearance microscopically. By far the greater part of the field is that of normal kidney. Here and there is a limited area of interstitial nephritis. The epithelium of the tubules and glomeruli is in a passive state and normal in appearance, except in limited areas where some degeneration is apparent. There is certainly no proliferation of epithelial cells in the tubules or glomeruli. An occasional cyst can be demonstrated. I am inclined to look upon this case as one of acquired unilateral cystic kidney.

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DISCUSSION.

Dr. Mereness: Allow me to call attention in the first place to the second subject with which I am credited, namely, An Anomaly of the Cervical Vertebræ. This specimen did not fall into my hands until some time after it was taken from the dissecting-room, consequently the appearance is not as good as I would desire to have it, but it is clean, and you need not be afraid to handle it if you care to.

Most of you know that one of the most constant features of the mammalia is the fact that they have seven cervical vertebræ. The long neck of the giraffe and the short neck of the American hog have the same number of cervical vertebræ. There are only three exceptions to this rule throughout the whole mammalia—there is only one example of the mammalia in which there are more than seven cervical vertebræ. Therefore, this specimen which I bring to you is, from a scientific standpoint, of considerable interest—I may say that it is very rare indeed, to find in the human being a greater number than the usual seven cervical vertebræ. In this specimen which I hold here, there are nine characteristic cervical vertebræ. If you will look them over carefully you will find that each one of these nine is a characteristic cervical vertebra, and bears all of the marks which distinguish vertebræ of that region. You will notice, however, that in two instances, two of the vertebræ are welded together, as near as I can make out, not by disease, but by original ossification. Two of these have been left in the natural state in which they were found, while two others have been sawn apart, as you will observe. The number of vertebræ, however, in the actual

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vertebral axis is not increased. There are nine cervical, but there are only ten dorsal; consequently this man had but ten pairs of ribs instead of twelve. There are a great many features of interest if we were to go into detail in the matter of this specimen, but without further remark I will ask those of you who are at all interested in this sort of thing, just to take and look at this specimen, which is rather a unique one.

Dr. B. O. Reynolds: While I will not occupy your attention in discussing this paper, I will say that I was present at the operation mentioned by the gentleman who read the paper, as having been performed in this state. It was not a cystic kidney at all, as I understood it at that time. It is a good while ago—I think it was in 1856—in Walworth county. The patient was named McGraw. I had seen the case twice in consultation before Dr. Wolcott was called. We regarded it as a tumor of the right side, and the question in our minds was, whether it was from the liver or the kidney; whether benign or malignant; I was there and assisted in the operation. The doctor was about as much in the fog as we were, but concluded to operate. The tumor was about as large as your double-fist, involving the lower portion of the right kidney. It was a malignant growth, its semi-fluid contents amounted, perhaps, to a tea-cupful of broken-down material, a grumous mass, and we considered it a cancerous growth. While they were dressing the wound, I dissected the tumor, and mistrusted that it came from the kidney, and discovered that it consisted of a kidney, a portion of which remained healthy; the ureter was absent. We had examined the urine several times—I did it myself—looking for kidney trouble, and we found the urine invariably healthy, which was accounted for because the urine secreted was only by the healthy kidney. That is the history, briefly, of that case. I merely mention it as an interesting incident of over forty years ago.

Dr. Friend: The microscope shows in this specimen a

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fibrosis. There is an excessive amount of fibrous tissue in this kidney. The probabilities are that the symptoms produced were the symptoms of a floating kidney. The result of the accumulation of fluid acting upon the kidney-tissue itself, produced a pressure atrophy of normal cells and an increase of connective tissue. If you will look at this specimen you will see that the tissues indicate an excessive amount of intrafibrillar tissue. From the history Dr. Mereness gives, all the symptoms were originally produced by reflex action on the sympathetic nervous system, caused by the enlargement and the pressure. In floating kidney, those symptoms are common. In floating kidney, with hydronephrosis, there is often found an increase of connective tissue. In this case the large cyst was probably made by the capsule of the kidney after the breaking down of the kidney tissue.

Dr. J. J. McGovern: This kidney was not a floating kidney. The kidney was in normal position and never had been out of place at all. The kidney was entirely cystic, the cysts were all over the kidney, small and large ones, hundreds and probably thousands of them, and I do not think that an obstruction had anything to do with it.

Dr. Friend: I did not say that, doctor; I said the symptoms in this case were the same as the symptoms in cases of floating kidney.

Dr. Hirth: I wish to say a few words in regard to the microscopical section under the microscope. I understand by Dr. Mereness that the specimen was prepared by Dr. Patek.

Dr. Mereness: The slide was prepared in the laboratory of the Milwaukee Medical College, and it is from a part of the kidney which is more normal than any other part.

Dr. Hirth: I understood from Dr. Friend that it exemplified quite a good bit of fibrous tissue. I should say, in-so-far as my knowledge goes of histology, that it is absolutely normal. I do not see any fibroid tissue or cyst-cavities, but I should say it was preëminently a normal specimen.

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Dr. Mereness: In the first place I wish to thank Dr. Reynolds. I did not know that we had a gentleman here who saw the operation that I referred to. My authority for making the statement that it was a cystic kidney that Dr. Wolcott removed, came to me in this way; I was in conversation with Dr. Oviatt about this matter one night, and he said that Dr. Senn had told him that Dr. Wolcott removed a cystic kidney at a very early day, probably the earliest on record. I then went to Dr. Marks, of this city, who confirmed the statement, and said that in 1855 or 1856, a cystic kidney was removed by Dr. Wolcott in this State. I am glad to hear Dr. Reynolds' recollections of this case.

In regard to the statement of Dr. Friend, as to the extreme fibrosis of this specimen under the microscope, I should say there is very little fibrosis in that specimen, except in small limited areas. The specimen throughout the greater part of the field is nearly a normal specimen of kidney. Dr. Friend says that these cases are often associated with floating kidney. If he will show me a recorded case, well authenticated, in which the symptoms of floating kidney are associated with cystic kidney, I will buy him a champagne supper.

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CLINICAL MEMORANDA.

BY F. SHIMONEK, M. D., OF MILWAUKEE.

CASE I.—Obstruction of the Common Bile-Duct or Hepatic Duct, probably gummatous.

CASE II.—Cholelithiasis. Forty Stones in the Cystic Duct.

CASE III.—One Stone in the Duodenal End of the Common Duct.

CASE IV.—Cholelithiasis. Two hundred and eighty Stones removed from the Bladder and Cystic Duct: Perforation of Bladder and Colon.

CASE V.—Laceration of the Middle Meningeal Artery, with Specimen.

CASE I.—OBSTRUCTION OF THE COMMON BILE-DUCT OR THE HEPATIC DUCT.

Etiology: Foreign bodies in the ducts, such as gall-stones, worms or hydatids: by stricture in any part of their course, or compression from the outside by inflammatory exudation or new growths in the neighboring organs, such as tumors of the pancreas, duodenum, stomach, and kidney.

The most important manifestation and at times the only one, is jaundice, which usually passes into profound cholemia. Few cases last longer than six months before cholemia appears, and death takes place within a year. Murchison reports a case in which there was complete obstruction for six years.

The case which I wish to report occurred in an unmarried lady, thirty-five years of age, by occupation a kindergarten teacher.

About four years ago jaundice developed without any other symptoms. Preceding this she was treated for nasal catarrh which eventually produced a perforation of the cartilaginous

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septum narium. Closest scrutiny failed to reveal anything else of importance bearing on the etiology of the case.

Perforations of the bony part of the septum are strongly indicative of a specific cause, provided trauma and operation can be excluded; perforation of the cartilaginous part may result from lues, but in the vast majority of cases it is the result of traumatism, generally from picking off a scab with the finger-nail, which develops from catarrhal inflammation. The only subjective symptom present was an intense general pruritus, which, by loss of sleep and a perversion of nervous action, almost drove the patient frantic. The only objective symptom was jaundice; feces deficient in bile; urine loaded with it. The pruritus was the direct result of the action of the bile on the nerve-terminals. In the absence of all other positive reasons, the diagnosis of obstruction of the common bile-duct was made, either depending upon a microbic inflammation of the mucous membrane and resulting in a stricture, or a gumma of the common duct, which, however, did not occur to me, because there were no data to judge by excepting the septal perforation which was not revealed to us until later in the progress of the case, and could not, therefore, be utilized as a guide in the therapeutics of the case.

Gumma of the passages is extremely rare; I am able to find only one case on record and *that* is not very certain. That case is reported on the *post-mortem* records of the St. Bartholomew's Hospital. It was merely suspected as such.

The variability in the intensity of the jaundice and the pruritus, showed that the obstruction was at times more, and at times less, but never wholly absent. This would tend to show that whatever the etiological factor was, it was not of a progressive tendency, or its increase was in a direction away from the bile passages, and when directly or indirectly the lumen became narrowed by congestion, all the symptoms became augmented. It seems to me that an analysis of the

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symptoms pointed to something occluding the common duct or the hepatic duct.

Careful percussion and palpation revealed nothing. An exploratory section was suggested to which the patient readily consented; indeed she was very anxious to submit to anything which would offer some hope of success.

The Greig Smith incision was made. The gall-bladder was full, but not excessively distended, and it was found impossible by gentle and firm pressure to empty or diminish its contents; the attempt was made again and again. Careful examination of the liver, biliary ducts, pancreas, stomach, and intestines was negative, this, however, by exclusion seemed positive evidence in respect to the cause of obstruction being in the walls or within the lumen of the duct, and acting on this supposition, I resolved upon and did a cholecystenterostomy with the Murphy button. Excepting a trifling and localized peritonitis the patient made a good recovery and the button was passed in eighteen days.

The subsequent history was satisfactory for a time, the pruritus, however, did not wholly disappear, and in the course of six or eight months the symptoms reappeared very nearly in their former severity. At one time antisyphilitic treatment seemed to be doing wonders, which apparently confirmed the suspicion of a gumma; it was not continued long enough to be certain on that point. About two months ago the treatment was resumed, and a fair trial will now be made.

The last report which was received from the patient seemed very encouraging; under the specific indication the jaundice and pruritus are diminishing, which apparently confirms the diagnosis of a specific obstruction.

CASE II.—CHOLELITHIASIS.

Mrs. W., age 40; multipara. Hepatic colic had existed for years, it was however, always treated for gastric cramp. The attacks kept recurring at variable intervals and gradually increasing in severity.

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The first attack, in which I saw her, was extremely severe and was only partially relieved by several hypodermatics of morphia. The attack was perfectly typical of cholelithiasis; positive diagnosis was, however, not made until biliary calculi were found in the passages subsequent to the next attack.

She had several attacks of minor severity which she regarded as of gastric origin. The last attack commenced with the utmost violence, in fact I had never seen such intense agony before, and the quantity of chloroform and morphia that was required to even partially relieve the pain testified to the reality of the suffering.

At my first visit I advised operative interference, but it took over a year of untold physical and mental suffering before she finally, but half reluctantly gave her consent.

During the last attack localized peritonitis developed in the region of the gall-bladder and extended almost to the crest of the ilium. No jaundice. My great fear was from perforation of the viscus, had it not already occurred. No amount of argument would convince the patient of the necessity of immediate interference. Finally the limit of her endurance was reached, and we operated as quickly as possible. The vertical incision external to the rectus was made. The omentum and colon were found adhered to each other and to the gall-bladder, as also to the parietal peritoneum. The gall-bladder appeared very dark, intensely distended, to the touch it felt hard and even, and when incised the walls were found to be nearly one-fourth of an inch thick; liver normal. The surroundings were carefully protected with sterilized hot sponges, and the organ was incised, followed by a great gush of bile and mucus, and to our great surprise not a stone presented itself at the mouth of the cut; not until the entire length of the index finger was introduced could any stone be felt, when by means of forceps and scoop forty stones were removed from the cystic duct. Further examination of the cystic and common duct failed to discover any more. The

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gall-bladder was fixed to the parietal peritoneum, the wound closed in tiers, and a rubber drainage-tube introduced into the bladder. Bile flowed through it freely for several days, showing a perfectly pervious cystic duct; gradually, however, it became very noticeable that the quantity of bile was decidedly lessening, and after the removal of the tube it ceased nearly altogether, excepting once in a very small quantity; instead of bile there discharged quite a large amount of a clear viscous mucus, the normal secretion of the gall-bladder.

The only reasonable interpretation of these events proves the production, by expulsion-pressure, of necrosis (the hypertrophy of the viscus shows that) of the tissues of the cystic duct and subsequently cicatrization and stricture. The adhesion showed that nature was getting prepared for the rupture, which was not far distant. In spite of the strictured cystic duct the external fistula gradually closed in about three months. In a few days thereafter symptoms of accumulation and an inability of the bladder-contents to be discharged became evident, *i. e.*, a round tumor and pain developed in the region of the organ, which immediately ceased upon applying steady pressure with the hand over the tumor and expelling the contents into the intestinal canal. This recurred at frequent intervals in the beginning, but it appears that the stricture is getting more patent, judging by the lengthening of freedom from trouble.

The proper thing, probably, would have been a cholecystectomy at the time of the operation, and the question always arises whether it is not best to remove the gall-bladder when in an advanced state of disease, yet one hesitates to sacrifice anything, whether of much or little importance to the economy, when not absolutely necessary, and that chiefly from fear of diminishing the patient's chances to recover; such patients have their vitality frequently decidedly lowered, and an additional shock might prove fatal. Of course,

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in malignant degeneration nothing short of a complete extirpation should ever be done where possible.

LATER REPORT—Nature has apparently succeeded in removing the obstruction, as no more pain, etc., have recurred during the last two months, and her health is good.

CASE III.—A STONE IN THE DUODENAL END OF THE COMMON DUCT.

Mrs. M., 33 years of age; married and has one child.

She has always been healthy until about three years ago, when what was called stomach-cramp developed, for which she was treated nearly that whole time before a correct diagnosis was made by finding gall-stones in the stools.

It seems almost incredible that a case with such markedly typical subjective symptoms should pass through the hands of ten or twelve doctors, in all stages of the disease, and yet none of them to even entertain a suspicion of the correct condition, if one may judge from the diagnosis made. The diagnosis varied from a tumor of the liver to cervical laceration, and, in fact, trachelorrhaphy was done while nature was striving to expel a stone, which was characterized by intense jaundice and pain.

I found her on her back with the lower limbs flexed on the body, face jaundiced and indicative of such extreme agony that even a partial physical examination seemed out of the question; she at the same time raised her arms saying, "Doctor, don't come near; please don't touch me." It was at once correctly surmised that we had a peritonitis to deal with, depending, probably, upon a ruptured gall-bladder or on infection, having extended through the walls of the viscus or its ducts; it was impossible to know which the correct interpretation was; at any rate, infection of the peritoneal cavity seemed undoubted.

The patient was at once taken to the hospital and prepared for an immediate operation. The moment an incision

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was made through the peritoneum, odorless and whitish pus welled up.

The adhesions were extremely dense and extensive, making recognition of the individual organs impossible, and consequently endangering the hollow viscera with laceration during the breaking up of the adhesions. Finally, the lower part of the liver was reached, from whence I gradually succeeded in separating the colon from the parietal and visceral peritoneum. The gall-bladder was so atrophied that its recognition was beyond even a possibility. Everything was infiltrated with pus; a pus pocket was struck posterior to the right lobe of the liver.

Up to this time nothing was found which would in any way explain the cause of so much infection; the fingers failed to find any stones, or anything of a suspicious character. However, after some time was spent in this fruitless exploration of the cavity and ducts, my finger came in contact with the head of the pancreas which, by its consistency and position was easily recognized, and in its immediate neigborhood I discovered a hard substance, very movable, about the size of a small marble, apparently in the wall of the duodenum, and by careful and gentle manipulation I was soon pleased to be able to bring this with the duodenum to near the abdominal surface, and at once recognized that I had the rare condition of a gall-stone in the duodenal end of the common duct before me.

The stone, which I now present, is about $1\frac{1}{2}$ or 2^{cm} in diameter; about one inch or more of the common duct holding it was dilated, it having the ball-valve action. It was very easy to dislodge the stone from one part of this cavity to another, which explained why it evaded the grasp of my fingers. It explains the intermittency of the jaundice which sometimes was unaccompanied by very severe pain, although generally extremely agonizing pain preceded it.

An attempt was made to push it through the duodenal open-

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ing into the intestine, but this was found impossible without producing a laceration of the tissues and exposing fresh surface to infection. Lithotrity was discarded because of the apparent hardness of the stone; the pressure which would have been required to crush it would undoubtedly have injured the integrity of the duct. Choledocholithotomy was therefore adopted as the most feasible procedure.

The stone and duct were grasped with the thumb and index finger in such a way as to press the calculus against the anterior wall of the duct, and thus remove it as far as possible from the important structures surrounding it, such as the portal vein and the hepatic artery directly behind and to the left of it, as also the vena cava inferior. The lower third of the duct is not directly in contact with anything important, so this is the place for an incision, yet when we consider that the common duct is only 6 or 7^{cm} long, we know that the knife is never at a safe distance from those important blood channels. The maneuver adopted removed the stone to a comparatively safe distance.

The incision was made parallel with the long axis of the duct and directly upon the stone, as it was firmly held, and with a pair of tissue-forceps it was readily lifted out of its bed.

The opening was closed with very fine silk in two tiers: first, the mucous membrane was carefully secured, then the peritoneum was brought very carefully together by the Lembert suture. The subhepatic space was very thoroughly irrigated with sterilized normal salt solution and drained with long strips of iodoform gauze reaching to the bottom of the pus-cavity.

There was no leakage of bile; the drainage acted very satisfactorily and the patient made an uninterrupted recovery, and is to-day perfectly well.

According to Courvoisier, only four per cent. of stones are found in the common duct.

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Conrade in 97 cases of cholelithiasis found stones in the gall-bladder in 82; in the gall-bladder and common duct in 10; and in the common duct alone in 5 cases. In two-thirds of the cases the stones are multiple, 6 being the largest number found. In 67 per cent. of the cases the stone is in the duodenal end of the duct, and in 15 per cent. in the hepatic duct; in 18 per cent. in the middle portion.

Fenger is of the opinion that the stones are more often floating in a cystic dilatation of the duct than is generally supposed. Smith is of the same opinion. The gall-bladder is, in most of the cases, shrivelled and atrophic. Fenger thinks the atrophy is easily explained by the ball-valve action of the floating stone at the end of the cystic duct. This does not, however, explain why it was nearly atrophied in our case since the bile certainly had free access to the gall-bladder, which must have been frequently over-distended.

Courvoisier puts it down to a cholecystitis set up by the stone when in the gall-bladder, and resulting in contraction of the bladder-wall. This, also, fails to account for this atrophic condition, because it is most frequent the longer the stone is arrested at the end of the common duct.

CASE IV.

Mr. B., aged 52 years; by occupation a druggist.

About twenty years ago commenced with what was then considered gastralgia. After that similar attacks occurred at long intervals; aside from this his health was very good.

Two years ago the attacks assumed greater severity, and were followed at times by jaundice of a short duration. Latter part of last year the attacks became still more frequent with greater pain. I do not think that stones were found.

The pain toward the last became continuous, although not unendurable; an extremely sore spot developed a little above the appendicular region and this misled his physician into the belief of appendicitis.

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On examination the patient's general condition was good. No temperature, no jaundice, digestion fairly good, yet he complained of uneasiness in the stomach after partaking of food. Objectively a very hard and smooth tumor could very easily be palpated in the region of the ascending colon, commencing beneath the costal arch and descending for about three inches, of an oblong and globular shape, not unlike a sixteen-candle electric globe, which, at its lower extremity, presented this extremely sensitive place above mentioned, evidently due to the tumor itself and had no relationship with the appendix.

The diagnosis was a gall-bladder and cystic duct full of gall-stones; the tender and painful place was considered an ulceration extending probably through the viscus and adhesions to adjacent organs. Immediate section was advised and urged, and, after a little delay, consented to.

The Smith incision was utilized. The tumor was readily separated from the omentum when it was found that an adhesion existed between the bladder and hepatic flexure of the colon. To the touch, the idea was conveyed that we had a solid growth instead of gall-stones to deal with, but on a closer investigation, the stones could be slightly moved one upon the other. The bladder with the colon were carefully surrounded with sterilized gauze sponges and the adhesions gently separated, when it was found that a perforation established by nature for curative purposes existed from the gall-bladder into the colon, and several stones were found in transit.

Nature would have probably succeeded in curing the patient if the adhesions would have held firmly enough to prevent separation and a spilling of the visceral contents into the peritoneal cavity and death. Two hundred and eighty calculi were easily evacuated. The organ was enormously hypertrophied and distorted, involving also the cystic duct.

The bladder was anchored to the peritoneum with catgut

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sutures and drained through a rubber tube. The opening in the colon was closed according to Lembert-Czerny. With the exception of secondary shock, which required plenty of stimulation with strychnia, salt water, etc., the patient made a very satisfactory recovery and in a short time gained a number of pounds in weight.

The operation was done last January by primary incision and fixation with chromicized catgut. The sutures failed to be absorbed and nature has expelled them one after the other, and yet the fistula persists, and by all appearances it will require a closure or a cholecystectomy. There is no reason why it should not close spontaneously, so far as the patency of the cystic and common ducts is concerned. In all probability the diseased condition of the bladder will delay or prevent its closure.

There is only a very small percentage of the bile coming through the fistula, and this in addition to the absence of jaundice and a very satisfactory general condition, proves the patency of the biliary passages.

The question of cholecystectomy was discussed at the time of the operation, but the firm adhesion of the gall-bladder to the liver, and the irregularity and compressibility of the pulse, forbade a more extensive operative procedure. The wisdom of this was shown when secondary shock appeared. I am morally convinced that he would not have survived. The fistula was closed successfully with sutures a few days ago.

There are the following approved methods of dealing with the gall-bladder:

Cholecystotomy with primary incision and fixation.

Cholecystotomy with primary fixation and secondary incision.

Cholecystenterostomy with the Murphy button.

Cholecystendysis.

The first is an incision into the bladder, removal of the stones, and examination of the ducts, fixation and drainage

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of the gall-bladder to the parietal peritoneum. This is a good operation on account of the possibility of a thorough examination of the ducts after evacuation of the contents of the gall-bladder.

The second method is safer so far as an infection of the peritoneum goes. Statistics show lower primary mortality. The gall-bladder is first fixed to the abdominal incision, then, when adhesions have formed, it is opened and the stones removed. This, of course, precludes an examination of the ducts and, therefore, in the long run is less successful.

Cholecysenterostomy with the button is only applicable where it is possible to thoroughly approximate the bladder with the intestine. In very friable or excessively thickened bladder-wall, it would be extremely unsafe, if not entirely out of the question, to accomplish a perfect anastomosis. In neither of my two cases was this procedure possible.

Cholecystendysis, or ideal cholecystotomy, is an operation where the gall-bladder is closed by three tiers of sutures and dropped into the peritoneal cavity; the abdominal incision is also closed. That this is extremely unsafe goes without saying. It is absolutely contraindicated (*a*) in all cases of large calculi in the gall-bladder; (*b*) in every case in which inflammatory conditions involve the gall-bladder or the structures in its immediate neighborhood; (*c*) in nearly all cases of perforation of the walls of the gall-bladder as the result of ulceration; (*d*) in cases of rupture and perforation of the gall-bladder when injuries are situated in the neck of the organ and cannot easily be manipulated; (*e*) in all cases in which there is a simultaneous obstruction of the common bile-duct. (Waring.)

In Czerny's modification of cholecystendysis the gall-bladder is evacuated, fastened to the parietal wall, the opening in the gall-bladder is closed, the abdominal incision is closed, excepting the part which has the viscus fastened to it, for the purpose of allowing external discharge in case of non-union

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of the bladder-wall. This seems to me a very important improvement upon cholecystendysis.

In excessively infected gall-bladder I believe that removal of the entire organ should always be done where circumstances will permit; if not, a thorough drainage with a tube should be adopted, and subsequently, if nature fails to cure the diseased bladder and to obliterate the fistula, either to remove the viscus or simply to close the fistula.

Each one of these interesting and instructive cases tells a story of its own, which, in cholelithiasis, points to the necessity of an early surgical intervention.

DISCUSSION.

Dr. Shimonek stated that he had overlooked a very interesting case of laceration of the middle meningeal artery, which he then presented and said:

This was taken from a man who was run into by a street-car and thrown out of his wagon, sustaining over the anterior inferior angle of the parietal bone, an injury of the soft tissue and of the bone. He got into his wagon unassisted and drove home; he was perfectly conscious.

A physician was sent for, who stitched up the flesh wound; but in three hours the patient became unconscious and in eleven hours died. There was a very peculiar fracture of the parietal bone, as you see. The anterior inferior angle of the parietal was fractured; the fractured extremity is square shape; no depression existed because it sprang into position again, so that by passing the finger over it the fracture could not be felt at all, unless examined very closely. But as the impulse of the moving body against this bone drove the fragment in, it ruptured the middle meningeal artery. The case is a very instructive one and speaks volumes. The clot has dried out very much, but yet you can see the depression upon the brain very distinctly.

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OPERATIVE TREATMENT OF HEMORRHOIDS.

BY L. P. A. VALENTINE, M. D., OF WESTERN UNION.

As the title of this paper will indicate, I shall limit myself to a consideration of that branch, without discussing the etiology, pathology, or other hemorrhoidal symptoms, neither shall I here discuss the varieties of the disease, but shall at once pass to the subject before us, and speak only of the Operative Treatment of Hemorrhoids.

There are three well-known and approved methods of operating upon hemorrhoids, besides the one I intend to present before this learned assemblage of the profession; namely, first, by resection of the entire hemorrhoidal area, known as Whitehead's method; second, by ablation and ligation, known as Allingham's operation; third, ablation of the entire hemorrhoidal masses by the use of clamp and cautery, and fourth, by transfixion and ligation, or Mathews' operation.

With quite a large opportunity to observe and test these various methods, advantage of which I have taken, I feel quite qualified to speak of their individual advantages and disadvantages, which have brought me to the conclusions which are the basis of this paper.

The objects we aim to attain in treating these cases operatively, are namely, to radically cure the patient of the trouble for which we operate; to subject the patient to the least compatible risk; to occasion the least amount of suffering; to accomplish the desired object with the least possible delay, and produce the least deformity to the parts involved.

Whitehead's operation involves the patient in a rather formidable operation, necessitating considerable loss of blood, a fact not to be overlooked in such a disease, as the patient is

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frequently debilitated from the frequent hemorrhages which are a very prominent symptom of the disease, quite often the patient being anemic. To assure its success, we must put dependence upon primary union of the wound, and consequently upon aseptic healing in a region where asepsis is almost impossible to obtain. The patient may be thereby exposed to the danger of septic poisoning by infection occurring in the wound, which will break down by inflammation. Should primary union fail, the healing will be tedious and protracted, resulting, sometimes, in a circular scar which will eventually contract and probably cause a stricture of the anus.

Although I admit that there might be some cases calling for this operation, in my opinion it is to be avoided in a vast majority of cases.

Allingham's operation which consists in excision of each tumor with ligation of the vessels at its base, is almost the same operation as the one I will describe.

I will not mention the carbolic acid injection. The clamp and cautery method which consists in cutting through the mucous membrane at the anal margin as far as the mass to be removed, next by grasping the entire mass in a special hemorrhoid clamp, then in trimming off the grasped mass with scissors, leaving sufficient of the base for cauterization, and finally in searing the entire cut surface with the Paquelin cautery at a dull, red heat, is a very good operation, preferred by many in the profession, but in my opinion is inferior to either Allingham's or Mathews'. The danger of hemorrhage is greater after the clamp; it is generally attended by the same amount of post-operative pains, and requires a special instrument and a cautery apparatus, not speaking of the assistance needed, while the following procedure is done with the ordinary instruments of the general practitioner, requiring only the same amount of time. Therefore, I prefer the operation to be described.

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This operation can be completed in from ten to fifteen minutes, and proves radical, if well performed. The healing progresses satisfactorily, and without inflammatory complications; less suffering is experienced by the patient after the operation; it offers no impairment to the functional power of the anus, and there is less danger of secondary hemorrhage.

The operation is as follows: First, as regards the preparation of the patient. He should be restricted to a simple, plain diet for three days previous to the operation, excluding all alcoholic beverages; the bowels should be relieved by a purgative two days, and by a saline the day prior to the operation, and finally the lower bowel is cleaned with an enema from four to six hours before the operation.

After having thoroughly anesthetized the patient and placed in the Sim's position, and of course properly cleansing the parts, the sphincter-muscle should be thoroughly dilated, with the use of the divulsor, or with both thumbs well lubricated, and making traction forward and backward, until the muscular spasm has been overcome. This divulsion is a very important step of the operation; in external hemorrhoids it is not necessary.

After the sphincter has been divulsed, one will be able to make a satisfactory examination of the rectum, and thoroughly search for ulcerations, fistulæ, etc. Each pile is grasped at its apex with a retracting forceps and brought down, causing a temporary prolapse. Now you should cut the mucous membrane near the anal margin; next, you transfix a double ligature through the cut in the middle line and at the base of the tumor; then cutting the ligature next to the needle, thus making two separate ligatures, you bring each one separately around each side and tie a surgical knot, then passing one of the ligatures in opposite directions below the transfixion point, and around the entire tranfixed pile, you tie it over, thereby making it impossible for the ligature to slip

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over the cut surface of the tumor, and preventing secondary hemorrhage. Finally you cut the tumor with your scissors, leaving enough at the base as stump to prevent the ligature from slipping over. This completes the operation. The after-treatment is simply confined to rest, good diet, and in keeping the bowels regular.

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SUPPLEMENTARY REPORT ON A CASE OF TRAUMATIC EPILEPSY TREATED BY CRANIECTOMY.

BY H. REINEKING, M. D., OF SHEBOYGAN.

At the last meeting of this Society I presented a brief report* of a case of traumatic epilepsy treated by craniectomy, resulting, so far as could then be determined, in complete disappearance of the convulsions.

Having been in position to follow the case quite closely since that time, and as conclusions based on the results of such operations can become safe and valuable only after prolonged observation, I take pleasure in presenting herewith a brief report of the subsequent history of the case up to the date of writing.

Following is a synopsis of the history as given last year:

Male, aged 26 years, farmer. Compound, comminuted fracture in left frontal region when thirteen years old, followed by marked depression and pulsation in the injured region. About twelve years later development of epilepsy, mostly nocturnal, not preceded by an aura, at least fifteen attacks in as many months, their severity increasing, his mental condition deteriorating.

Operation January 4, 1897. Elevation of a large bone flap, exposing a large mass of cicatricial tissue and firm adhesions between the cerebral cortex and the inner surface of the skull. Excision of all this tissue and breaking up of all adhesions, resulting in a large defect in the dura; insertion of a gold plate made by annealing several layers of dentist's foil, and sufficiently large to extend beyond the margins of the defect for at least one-half inch, its insertion being facilitated by cutting it into four sections. Healing by primary union; de-

*See Transactions, 1897, p. 135.

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pression at seat of injury and pulsation much decreased. No return of convulsions up to time of last year's report. Mental condition much improved.

About the middle of May, 1897, the patient had a slight attack, after undergoing severe mental excitement, and a second attack, also mild, occurred about six weeks later. Since that time, now over ten months, no convulsions have occurred. He is working a farm, is able to do a hard day's work, and in his mental and psychical condition shows no evidence of that deterioration which began to manifest itself before the operation.

It may be safely concluded, therefore, that in this case the cause of the irritation was found in the cicatricial adhesions between the cerebral cortex and its coverings, and that the good results of the treatment are to be ascribed to the thorough liberation of the brain from all abnormal adhesions, and the precautions taken to prevent their subsequent formation.

For the latter purpose the use of a gold or other metal plate can be safely recommended, both in cases of recent injury and in late operations. It should be used whenever there is a probability of the injury or operation leading to a defect in the dura mater, or to adhesions. It is safe to say that by its proper use in the treatment of recent fractures of the skull the number of remote sequelæ of such injuries will be greatly reduced.

DISCUSSION.

Dr. Reineking presented the patient referred to for examination, and said: I have the pleasure to-day of presenting the patient, and while the discussion is going on I would be pleased to have you examine him. What I wish to emphasize particularly is the use of plates for the purpose of preventing those results which are so apt to follow at remote periods after injuries to the skull.

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Dr. Shimonek: I wish to have Dr. Reineking state what plate he used.

Dr. Reineking: I used a gold plate made of several layers of dentist foil, annealed by means of a roller machine used by dentists. You can see the large surface covered by the injury. The bony fragments included in this flap were removed, because, being small and irregular, it would have been impossible, leaving them in place, to make sure of preventing further pressure, so that now there is practically no bone underneath this flap, but there is a great deal less pulsation than there was before the operation, and I attribute that to the use of the gold plate which is sufficiently strong to prevent marked pulsation.

Dr. Bill: That gold plate is in there now?

Dr. Reineking: Yes, sir.

Dr. Bill: On the inner or outside of the skull?

Dr. Reineking. On the inner side between the cortex and the dura.

Dr. B. O. Reynolds: Is it possible to feel the pulsations through it?

Dr. Reineking: Yes, sir, slightly, but not nearly as much as you could before the operation, when the bone fragments were there.

Dr. Bill: What was the age of the patient when he was hurt?

Dr. Reineking: Fourteen.

Dr. Helm, of Rockford, Ill.: I am not a member of the Society, but I would like to say that in New York, two years ago, I saw a plate of celluloid taken from a man's skull by Dr. Meyer, which had been in place fifteen months. It left a perfectly clear membrane, but thickened underneath. There were three operations. Both previous ones had relieved the man for a time. These plates set on a shelving ledge, the inner table was cut to the size of the original opening of the skull; the outer table was chiseled a quarter of an

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inch larger, so that it made a shelf for the celluloid, which fitted perfectly. The man was relieved for six or eight months the first time, for fifteen months the second time, and after that I lost track of the case.

Dr. Reineking: I have been asked where the plate was put, whether it was between the cortex and dura mater or between the dura mater and the skull. The prime object in using a plate of this kind is to keep the cerebral cortex free from all adhesions, and therefore the plate was placed between the pia mater and the dura mater. It was not surprising, on getting in there and finding the mass of cicatricial tissue, that the man should have epilepsy; the cortex was firmly bound to the skull and continually pulled upon. If such conditions occur, there is going to be some damage done; irritation of the brain will result; and it was my object to prevent this constant irritation of the cerebral cortex.

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THE PATHOLOGY OF THE ENDOMETRIUM.

BY G. A. KLETZSCH, M. D., OF MILWAUKEE.

Introduction.—My endeavor will be to make this paper of more practical than scientific value. We are frequently called on to make a diagnosis of the diseased conditions of the endometrium, and little think of what serious import it may be to the life of the woman. The general practitioner is oftener placed in this position than the specialist. He hears of any irregularities pertaining to the generative organs long before they are brought to the attention of the gynecologist. Heretofore our deductions were based upon clinical symptoms and illustrated by digital examination, aided by instruments. To these are now added two other positive methods of investigation, the bacteriological and the histological, both of which have of late years been applied to diseases peculiar to women, and surely aid us in making a correct diagnosis. For this advance we are indebted to Prof. Carl Ruge, of Berlin, and to Prof. Winter, now at Kœnigsberg. The technique of the methods employed are now the property of the profession at large, and much additional work has been done in this country, as well as in Europe in general, to perfect the same.

To my mind we are dealing with a very important membrane, the nature of which is not yet fully understood or its character recognized. For a long time it was even entirely ignored, notwithstanding that a large percentage of the diseases fatal to women could be referred and directly traced to it. A uterine hemorrhage was often overlooked and, as frequently, wrongly interpreted. We have no other symptom on which we can place any reliance, and this as often misleads us; for a hemorrhage can come from a benign as well as a malignant affection. At the present day we have means at hand by which we can positively differentiate a benign from

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a malignant affection, and while the organs of the woman are still intact. An immense stride forward, and an incalculable boon to woman. We only need now, that the bloody discharge which is natural to woman is constantly kept in our mind, and any irregularity cautiously investigated, and the reason for it determined. Schroeder, I think, has come the nearest in judging the discharge from the uterus correctly, when he says that the endometrium has but little other discharge than the bloody one, in the changes of which from the normal, we are to look for the symptoms of diseases of the lining membrane of the uterus. If the symptoms warrant the procedure, with a minimum of danger to the woman, a curetting of the uterus can be undertaken. The procedure is not only for diagnostic purposes, but is as well the proper method of treatment. From the removed particles a positive diagnosis can be gained as to the true histological condition of the endometrium. Upon the result of the microscopical examination we can without fail base our further plan of treatment. In explanation, I may add here, that from the endometrium most all of the malignant affections of the uterus have their origin.

The Anatomy of the Endometrium.—I will not digress much further from the subject of my paper, but must describe in short the anatomy of the lining membrane of the womb, upon which I can base my pathological data. The endometrium is divided into two parts, that which lines the cervical canal and that of the cavity of the uterus. My attention will not be given to the former, as it is constantly open to our inspection. I will treat of the endometrium proper, that which lines the cavity of the uterus.

The endometrium is intimately connected with the muscular walls of the cavity. There is no intermediate tissue. The m. m. ends abruptly on the muscular wall. *At birth* it is not fully developed and it retains its fetal character up to the eighth year of the child. Slight changes now begin, but the real development does not commence until the age of *puberty*.

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It now undergoes rapid growth and is prepared for the functions which it is destined to perform. At this time of life the important process of menstruation begins. *Womanhood* is soon reached and with this period of her life another physiological requirement is added to this membrane, that of gestation. In this we really see the true character of the endometrium. With every pregnancy it is destroyed, but as it possesses one qualification which no other membrane in the body has, that of regeneration, it very soon reestablishes itself. With the *menopause* the physiological activity of the endometrium ceases, but frequently the inherent force cannot be suppressed and it is now that the dangerous pathway of a woman's life is trodden. Retrogressive changes should now set in and the condition of *senile atrophy* is the result.

In childhood the endometrium is thin and smooth and contains but few glands. After puberty it grows thicker, becomes vascular, the glands multiply. In womanhood it is a soft, velvety membrane and has reached its fullest thickness. The surface is studded with openings of the glandular ducts. In old age it shrivels up and the surface becomes uneven. Many glands are obliterated and others are constricted.

Histologically, the endometrium is composed of an epithelial membrane which covers the surface and lines the glands, and a reticulated structure which is of a compound nature, in the meshes of which are found many cells of different size and property. The *uterine glands* are tubular in shape, in the virgin straight, in womanhood slightly convoluted and are formed by the epithelial lining dipping into the mucous membrane. They should not extend through its whole thickness. The glands are few in number in girlhood, multiply up to womanhood, are capable of being regenerated and are obliterated in old age. It is still an open question whether they produce any secretion, physiologically or pathologically. They serve as crypts in which the chorion fastens its villi. The uterine glands, as well as the surface of the endometrium are

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lined only by a single layer of cylindrical epithelium, which after puberty and before the menopause has cilia. Normally about one gland is found to four times the space which it occupies.

The interglandular tissue is composed of a delicate adenoid tissue which gives it its character, and a fine reticulated structure from which it derives its strength. In the meshes of the whole lie several kinds of cells, some round cells and others of the lymphoid variety. Prof. Ruge recognizes only one kind of cell, the round-cell, or as he calls it, the stroma-cell, and gives to it several properties. At one time by simple multiplication it should produce the numerous cells which are found in round-celled infiltration, and at another time it undergoes hypertrophy, and then we have the important decidua-cell, two extremely different products.

The glands of the endometrium are easily enough demonstrated, but the interglandular tissue is a much more complex structure. The adenoid tissue is probably a fine ramification of the lymphatic system which envelopes the generative organs, and the reticulated structure is in close connection with the circulatory system, of which the uterus has so abundant a supply.

The Pathology.—The diseased conditions of the endometrium may be of acute or chronic nature. The acute are seldom limited to the membrane itself, but the whole uterus is affected. They are generally of septic origin and belong to the puerperal state. The chronic changes are those which interest us mostly, as it is from these we are called upon to make a differential diagnosis in case of suspicious symptoms. I will, therefore, subdivide the chronic diseases into benign and malignant, and will cite a few diagnostic points, by which we are able to judge the one from the other. As I have already stated, the endometrium undergoes physiological processes, and these often lead to abnormal conditions, when the normal

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function of the membrane is interfered with. These belong to menstruation and gestation.

The chronic diseases of the endometrium, besides being of a benign or malignant character, can affect the glands or the interglandular tissue separately or collectively. In the benign changes the glands are affected as follows: *1st.* The utricular gland grows larger, making *glandular hypertrophy.* *2d.* The uterine glands multiply, producing *glandular hyperplasia.* In the hypertrophic form the gland varies from its straight course. As the thickness of the mucous membrane is limited, and the gland limiting its normal growth to it, the gland takes on a spiral, a corrugated, and often a crushed form. If they have a tendency to grow towards the free surface of the endometrium, they then project over it and give the membrane a rough, fluffy appearance. If this process is a general one, we find the *fungoid degeneration.* If it is circumscribed, it forms the small *mucous polypoid degeneration.* Should the gland grow in thickness, the lumen is dilated and filled with the inverted epithelial lining, which sends innumerable projections into the lumen. However, whether the gland grows in length or in thickness, the epithelial lining never changes its single layer. (On this finding alone can we base our differential diagnosis.)

In the hyperplastic form the number is increased, but the gland retains its tubular shape and straight course. In a cross or vertical section of the mucous membrane, the number of lumina in comparison to the interglandular tissue is out of proportion. The specimen is studded with holes. There are also several varieties: *1st.* There may be an entirely new formation of glands; the process of development is exaggerated. *2d.* From near the neck of the gland offshoots grow into the interglandular tissue; or, from the whole body of the gland, diverticula may be given off, or the end of the gland may divide and subdivide, forming new glandular tissue. Whether it be hypertrophy or hyperplasia, the gland limits

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its growth to the mucous membrane, the epithelial lining is always of a single layer, and there is some interglandular tissue demonstrable, if it is a benign process.

The pathological changes in the interglandular tissue show also several forms. I might at first mention those which are physiological, but act abnormally. *In menstruation* the mucous membrane is succulent at the beginning of the act, then becomes engorged with blood when extravasation of blood takes place, on the surface as well in the interglandular tissue. In a healthy woman, that which is not discharged is soon reabsorbed, and the mucous membrane is again normal. All of this process occurs with but little discomfort to the woman. In *dysmenorrhea*, a state of inflammatory condition exists, a round-celled infiltration with considerable exudation is present and the blood is discharged with difficulty from the endometrium. In *membranous dysmenorrhea* the cells are of a spindle-shape, out of the exudation a fibrous membrane is formed and it is discharged either in pieces or as a cast of the cavity of the uterus.

In gestation, the *decidua-cells* are soon formed out of the elements lying in the stroma of the mucous membrane, and, when this act is completed, they soon return to their original character. In case a part of the placenta remains attached to the maternal membrane or even a villus remain embedded in a tubular gland, the decidua-cell does not undergo involution; at this point they, so to speak, remain alive. Directly, it leads to the formation of a *placental polyp*, which projects into the cavity of the uterus; or around the foreign material, which lies in the mucosa, an inflammatory action is set up. This retention of placental material is probably one of the chief causes of subinvolution of the uterus.

These conditions are oftener found after an abortion than from a normal labor. I can make the statement here that the *malignant deciduoma* is one of the serious results of retention of decidual material. It may also be in place here to

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state, that the decidua-cell is the exact counterpart of the sarcoma-cell. It is not always easy to diagnosticate between the two.

The real pathological changes of the stroma are an increase in the elements of which it is composed. The round-cell can multiply in number, making a round-cell infiltration, in which the glands are spread apart and the interglandular tissue is increased. This can be a transitory condition and the overproduction of cells be reabsorbed. A fibrous degeneration of the stroma may occur, a spindle-shaped cell is the outcome, a striated appearance is given the membrane and retraction follows. In this, shrinking glands may become obliterated, or constricted, when the gland may be forced to change its course. The secretions may be partially retained and the gland becomes dilated, or the duct is compressed and the gland undergoes cystic degeneration. The walls of these cysts are still lined by a single layer of cylindrical epithelium. In extreme cases of retraction, the mucous membrane is thin, the surface is uneven, the glandular element is nearly entirely wanting, and the endometrium is in a state of *senile atrophy.*

At other times with the round-celled infiltration, considerable exudation is thrown out, and a fine granular mass is found between the cells. The interglandular tissue is not only increased but the cellular elements are spread apart. The utricular glands are compressed and crushed.

As these conditions are found separately so they are also present combined. It is rarely that we see each in its pure state. More often a *mixed form* is met with. We see glandular and interglandular changes in the different particles of the curetted material. As the one preponderates over the other, so we designate the disease. Whether it is a benign process or a malignant one, is a harder problem to solve. This is the real object of our investigation. Our surgical statistics have shown that it is only in the knife that the absolute cure of cancer is met with. It is only necessary that

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we perfect our methods of diagnosis so that we are able to detect this dread and deadly disease as early as possible. The treatment is then plain.

The Malignant Affections of the Endometrium.—In order to clearly understand these, we must be thoroughly conversant with the benign changes which the endometrium shows. The malignant, as well as the benign diseases, have their origin in the two component parts of the membrane: *First*, the carcinoma, in the epithelial lining, either of the glands or of the surface; *second*, the sarcoma, in the interglandular tissue. The character of a benign or a malignant affection, the anatomical construction, and the origin of each is entirely different. It is not at all likely that, out of a benign affection, a malignant disease results; but that each has its own individual character given to it, at the beginning of the process, which we are at present not able to distinguish early in the development of each.

Malignant Adenoma.—The one malignant process, which in character is close to a benign affection, is the adenoma malignum. In this the *glandular* element in the mucous membrane is enormously developed. The lumen of the gland, as well as the single layer of epithelial lining is clearly demonstrable. But you are unable to find a glandular outlet. The gland as such can not be found. In the hyperplastic form of endometritis the gland is still present. You can see its lumen, you can follow its course, and it is still surrounded by interglandular tissue. In the malignant form it has lost its individuality; the one important factor, its outlet, is lost, and lumina, lined by a single layer of cylindrical epithelium, are found close together. The mucous membrane is much thickened, is soft and velvety, and does not abruptly end on the muscular wall of the cavity; but glands can be found embedded in between the bundles of muscular fibers. For all that it is cancer, it is still a pure malignant adenoma, as the lumen of the gland is left, and is only lined by a single layer

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of cylindrical epithelium. In this you can see that the gland is the invading element. As soon as the single layer of epithelial lining is lost, and the lumen is filled with a mass of epithelial cells, then we have an *adeno-carcinoma.* In this the alveolar arrangement is of secondary importance.

Carcinoma of the body of the uterus. In true cancerous degeneration, the starting point of the disease is the individual epithelial cell. It loses its single condition, begins to multiply, breaks through its basement lining of the gland or surface of the membrane, and develops in the stroma. Here we get the primary alveolar formation of the structure of cancer. We find epithelial cells out of their anatomical position, in an alveolar arrangement, but these without a lumen. The whole character of mucous membrane is destroyed and very soon this condition spreads to the neighboring tissues. However, the epithelial cell only increases in number and does not change its character. In another form of cancer, the cylindrical form of the cell is changed into a flat epithelial cell. The surface of the endometrium is covered by numerous layers of flat cells, and projections are sent into the depths of the mucous membrane. This gradually destroys the glandular arrangement, and in the mucosa the alveolar condition does not only exist, but cancroid pearls are frequently found.

In any of the forms, as the growth is composed of more or less epithelial cell or more or less of the alveolar structure, so the consistency of the tumor changes.

Sarcomatous growths take their origin in the interglandular tissue, and are so-called as they give an appearance of fleshy masses. Their elementary origin is from the round cell, which has already been described. There are three main varieties: *First*, there is an over-abundant production of round cells; they retain their shape, but increase in size, and gradually destroy the glands of the membrane. In this form we see nothing but round cells. *Second*, the round cell after its production is changed into the spindle-shaped cell, and the

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growth has a striated appearance. *Third*, the round cell grows large in size, and the nucleus divides and subdivides, producing the giant cell. This gives then the *round-celled*, the *spindle-celled*, the *giant-celled sarcoma*, in all of which the glandular character of the endometrium is destroyed, the interglandular tissue loses its reticulated appearance, and the muscular walls of the uterus are soon involved. Sarcomatous masses may grow to large size and retain their surface intact. Cancerous degeneration soon brings decay of its new product, and an ulcerated surface is the result.

In *Fibroids* of the walls of the uterus the endometrium undergoes changes but they are more of an irritative character than of new growth. Whether the fibroid is subserous, interstitial, or submucous, the mucous membrane shows increased activity due to the engorgement of the uterus. The capillaries in it are often found very prominent and the glands in a hyperplastic or hypertrophic condition. In polypi in the cavity of the uterus the polyp is covered with the lining membrane of the cavity, and it frequently shows great changes but usually of benign character. In sarcomatous or cancerous degeneration of fibroids the starting point is in the elements of the endometrium.

Tuberculosis of the endometrium is usually of secondary form. Either the tubes of the ovaries are affected or the systemic invasion is somewhere found. Whether of primary or secondary form, small tubercles are deposited in the mucous membrane; they soon increase in number, a large mass or tumor is formed, in which caseous degeneration sets in and an ulcerated condition is the result. The tubercular nodule as well as the bacillus can be demonstrated in the more preserved parts of the endometrium.

In displacements of the uterus, as also in inflammatory conditions in the pelvis, the endometrium undergoes changes, but they are only of a benign character.

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Only a few words to sum up and recall the important points upon which I wish to lay stress:

1. That by the aid of the microscope we are able to make a positive diagnosis as to the histological condition of the endometrium.

2. That as in the endometrium many diseases have their origin which prove serious, we should resort to this method of examination.

3. That from the histological condition found, we can, without fail, determine our line of treatment.

4. That we should constantly bear in mind and investigate any bloody discharge from the uterus. It is the only clinical symptom which we ought to recognize.

5. Curetting of the uterus is a minor surgical act when properly carried out and applied to the proper case.

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THE COUNTRY DOCTOR IN THE PRACTICE OF MEDICINE.

BY W. T. SARLES, M. D., OF SPARTA.

The resources of the country doctor in the practice of medicine should be as ample as the fulness of the seas and as fertile as the lands of the earth. His courage and faith must be sufficient to remove mountains, and his gentleness that of the lamb. His life must be one of perpetual sacrifices, and his death that of the laborer of whom it is said, "well done thou good and faithful servant," etc. All this is desired, and even required by his patients, but the law very sensibly enacts as follows:

"One practicing in a small town or sparsely settled country district is not to be expected to exercise the care and skill of one residing in and having the opportunities afforded by a large city. He is bound to exercise the average degree of skill possessed by the profession in such localities generally."

The ordinary and reasonable care, skill, and diligence, which the law requires of physicians and surgeons is such as physicians and surgeons in the same general neighborhood, in the same general line of practice, ordinarily have and exercise in like cases. So while the doctor has the ideal for his motto in theory, the law requires only a percentage of that ideal in his practice. The country doctor having to treat the same mechanism of God's handiwork as does his city-brother specialist, merges almost daily into the surgical, gynecological, and a dozen or more branches of specialism with his numerous patients. And while he has the pride and disposition to treat them all as well as they could be treated under any other circumstances elsewhere, how can he be expected to do

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so, and who knows better than the doctor himself that he cannot? However, he can treat such patients equal to his skill and environment, and the question of when and how to better their condition is one often perplexing.

Again the law says: "If a physician or surgeon is not competent, or feels that he is not competent, to treat a case, it is his duty to recommend the employment of another, but if he is competent and so considers himself, and is in doubt concerning the case, he should use his best judgment as to consultations with other physicians and surgeons. But the refusal to accept the assistance of another in the treatment of a case imposes no higher duty upon a physician or a surgeon." Thus it will be seen the law is not imperative, but leaves the acceptance or rejection of counsel or assistance, entirely with the judgment of the physician or surgeon in charge of the case.

The doctor alone in the country, distant from surgical counsel, with a case of surgical appendicitis on his hands, is ever at a loss to give the best-known help to his patient, but is giving him the best practiced in his locality, and which is even better than that practiced by the specialist of ten or more years ago. The patient is destitute of modern conveniences or mode of living, owing to lack of means. The doctor, however, knowing his patient's needs, seeks surgical assistance even at his (the doctor's) own expense. The surgeon is called. The doctor settles the bill. The patient recovers. He thanks the doctor. Nothing more is expected.

The following year this dutiful patient aids another physician to get a start in this community, (which now barely supports the man who has given all his time and money for the best medical services obtainable). This dutiful patient tells his friends that had this new young doctor been there when he had appendicitis he wouldn't have had to send away for a surgeon and thus spend his money. This all comes home to the faithful doctor. He wonders why he called his surgical

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friend out to operate; why he didn't let this fellow die as they did ten or more years ago, and then he would have had his friendship, would not have been out his time and money and would have done all the law required. This case, no doubt, represents the exception rather than the rule, but the country doctor is not situated as is his city brother. He cannot exchange an eye case for one of appendicitis, nor a case of stone in the bladder for one of lacerated cervix uteri, as specialists may dictate in the city; but he must do the best he can with the knowledge and skill he possesses and the conveniences he has at hand. He cannot always do as Dr. Jonathan Hutchinson says of himself: "Acting on the rule of conduct that he would never keep a patient in his own hands if he believed some one else could do what is needed with greater prospect of success;" for it is often impossible to obtain that some one for lack of time or money, and oneself might save the life of his patient though by somewhat unskilled means. When, however, should he call counsel. First, always when demanded by his patient who is able to meet his demands, and second, always when, in the judgment of the doctor, his patient or himself will be sufficiently benefited thereby, in both instances it being in the range of possibility. The country doctor is always open to counsel. His numerous cases and experiences lead him early to see the limitations of his healing powers and he watches the laboratory and hospital clinical reports with keen observation, hoping for improved methods of treatment. How quickly the country doctor grasped the principles of asepsis and antisepsis, and of serum-therapy, especially as applied to diphtheria. This being the tendency of the country doctor's mind to receive more than to impart the teachings of the laboratory and clinic, what is his first obligation to the clinical teacher and specialist as well as to his patient? It can be no more nor less than the furnishing of material in the form of pathological specimens and patients at his command which he cannot himself competently exam-

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ine or treat in the interest of science and of his patient. He can thereby assist in the accumulation of data upon which he bases his daily practice. How few doctors review their own experiences simply, in the disposition of one of their desperate cases, but rather turn to these extensive clinical reports for the basis of their judgment? In return the specialist should reciprocate the kindness of the country doctor by courteous and fair treatment of himself and of his patients, as well as the mutual publication of such cases as will further enlighten the profession.

The assistance and protection of counsel one with another among general practitioners irrespective of specialties is apparent to us all, but the office-work of the specialist is distinctly essential to the highest type of medical and surgical practice.

The Lancet (London), in its issue of January 1, 1898, says: "The general practitioner has, as a whole class, fallen, we regret to think, upon ill times. His work has grown no lighter, his responsibilities are no less exacting, but in many directions his remuneration has decreased. He is suffering in part from the over-crowding of the profession, in part from the competition of lay associations, in part from the faulty administration of certain great medical charities, and in part from the rampant prevalence of quackery, which enjoys in this era of civilization an immunity that is as perilous as it is astounding. Quacks there have been, and quacks there will ever be, but never, we believe, in the history of the world, have the mendacious statements of the charlatan enjoyed such credit, or his worthless wares been bought so cheerfully and so universally at such exorbitant prices as now at the end of the nineteenth century." But as has always been the case for ages past, at least, genuineness has its imitations, and as specialisms become luminous in medicine and surgery, the quack becomes a reputed specialist. He enters the country town a being superior to the general practitioner. The

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chronic patient takes this opportunity to visit the so-called specialist, he gets the counsel for which he pays in advance, and after being duped and doped, he retires cursing the country doctor for once having told him his case was complicated, and was one for the specialist.

Dr. Willis P. King, in his book entitled "The Country Doctor," says: "There are *nurses* and there are *nusses*." Thereby representing respectively the trained or professional and the quack nurse. In like representation we may say there are *specialists* and there are *speciality-ists*, the former representing the highest types of medical and surgical proficiency, and the latter their lowest types. The general practioner has always been in demand since his advent in the arena of usefulness, and always will be. The evolution of the practice of medicine and surgery makes it necessary for him to make some changes in his professional and business methods in order to keep abreast of the times. But neither the high order of the specialist nor the low order of the quack will detract from his usefulness in the country districts at least. The noble achievements of the specialist will give him better equipment and methods of treatment in the accomplishment of his mission to suffering humanity, while the vagaries and deceit of the quack availeth nothing.

Equipped with modern literature and appliances, directed by application and constant care for the welfare of his patients, the country doctor in the practice of medicine will be able to accomplish more in the future than in the past, and his services will be in increased demand even to the end of time.

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EPIDEMIC CATARRHAL JAUNDICE.

BY C. M. BEEBE, M. D., OF SPARTA.

Epidemic catarrhal jaundice is by no means uncommon, and in this paper I have no new ideas to enlarge upon.

I shall simply review briefly a few facts familiar to all of us, and describe in few words an epidemic that it was my fortune to experience, and which was in many ways very interesting to me, and I trust may be of some interest here.

The epidemic mentioned, occurred during the months of August, September, and October.

My case-book shows that I saw and treated forty-six cases during that time, and I know of many cases treated by other physicians, and still others who were seen by none.

The epidemic was confined to one county largely, and I have not been able to learn that the physicians of adjoining counties experienced any unusual number of cases during that time.

The infectiousness of the disease was plainly manifest. Very rarely was a single member of a family affected while the others remained immune.

My youngest patient was a child of fourteen months, and my oldest was a man of 56 years of age.

During these months there was no unusual amount of typhoid or malarial fevers. During the spring preceding, the epidemic of grippe was very severe in this locality. I have no way of knowing, however, whether my patients had suffered the grippe, or whether it had any etiological relation, as some have claimed.

In most of the cases several days of prodromal symptoms preceded the appearance of the jaundice.

These prodromal symptoms were those common to a gastro-

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duodenal congestion and catarrh; nausea, vomiting, a sense of oppression over the epigastrium, and headache.

In a very few cases there was marked tenderness over the liver.

The jaundice usually appeared first in the conjuctivæ, then in the skin.

The shades of color ranged from a pale lemon-yellow to a deep yellowish-brown, and when the jaundice had been very persistent, shades of green and blue could be detected.

Along with the jaundice came another set of symptoms caused by the retention and absorption of the bile.

The bowel, lacking the stimulus of the presence of the bile, became torpid, and obstinate constipation ensued.

Fermentation of the intestinal contents with the resulting flatulence followed the retention of the bile.

The stools gradually lost their color, and in aggravated cases became almost white, and of a very offensive odor.

The urine assumed a color that varied from a dark brown to a deep yellow, the froth on the top at all times showing the yellow tints.

The sweat and milk became deeply stained, and where a jaundiced mother was nursing a child, it was found best to wean it.

The effect of the jaundice upon the nervous system was very marked, the pulse was usually slowed, the patients were usually in an abnormal mental condition, some excited, while others were dull, and in almost a typhoid apathy.

The temperature remained in most cases, normal. Where complications were present, and in two cases that assumed a malignant form, pyrexia was a special feature.

Headache and insomnia were common.

The presence of the bile pigments in the skin produced an intense itching, and often the skin had an unnatural harshness.

I had occasion also, to notice the slow healing of wounds in jaundiced persons.

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In one patient who had been jaundiced about a week, I mistook the pains of a beginning appendicitis, for the usual flatulent colic.

In this case the appendicitis assumed the fulminant type, with very general peritoneal infection and tardy localization.

The case, which at first appeared a hopeless one, finally became localized and after the evacuation of an abscess, the patient made a slow recovery.

The duration of the jaundice in this epidemic varied from one week in the mild cases, to eight weeks in the most protracted one.

In this protracted case the disease during the first three weeks was much the same as in the majority of mild cases, then instead of getting better the symptoms became more distressing and the jaundice deeper. The temperature gradually rose to 105°, the intestinal flatulence was very distressing and constipation more obstinate. The mind at times was depressed, and at others he was delirious.

At one time we suspected a complication of typhoid, but after a careful study of the case (without the aid of Widal's test I might add), we concluded that it was simply a case of malignant jaundice; recovery quickly followed the appearance of bile in the stools.

The case that I am about to describe was the only one that, to my knowledge, proved fatal during this epidemic.

CASE.—A boy of two years of age. The little patient was convalescent from a mild attack of broncho-pneumonia.

His first symptoms were referable to stomach disturbance; nausea, vomiting, and abdominal distress.

These indefinite symptoms persisted about three days, when he became jaundiced, the stools lost their color and bile appeared in the urine.

The child had an irregular, intermittent fever, ranging from normal to 104° F. The pulse varied in the same irregular manner.

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The nervous symptoms were very prominent, the child was very restless, sleepless, and at times delirious.

The jaundice gradually became deeper and the stools colorless.

The bowels were very constipated and the child suffered much flatulent colic.

The patient remained in this condition with symptoms gradually increasing for ten days.

During the last two days the temperature ranged very high, at times as high as 106½° F., and the child appeared profoundly intoxicated.

After a violent delirium the little patient lapsed into a deep coma, in which he remained till death.

Just previous to death there were several severe convulsions.

During the last two days hemorrhages appeared under the skin of extremities, and large quantities of blood were vomited from the stomach.

We were unable to obtain urine in sufficient quantity to demonstrate the amount of urea passed, but we demonstrated to our satisfaction the presence of leucin and tyrosin.

Acute yellow atrophy of the liver is a very rare disease, and is caused by a very rapid disintegration of the liver-cells, with a resulting toxemia due to the presence in the blood of the elements of the bile. Its duration is usually from two to ten days.

To this disease belongs most of those that terminate in death, with violent cerebral symptoms after a malignant jaundice.

This disease seldom appears in children or in those over forty years of age.

In women it appears often as a result of a severe nervous shock, and during pregnancy. Its result is always fatal and treatment is futile.

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The case mentioned may have been simply a malignant jaundice, with the consequent alteration and deterioration of the blood, due to the presence of the constituents of the bile and the previous broncho-pneumonia. Perhaps the hemorrhages may be explained in this manner.

I am, however, of the opinion that the jaundice was terminated by an acute yellow atrophy of the liver.

There was no *post-mortem* examination to confirm my opinion, but the group of symptoms, jaundice, irregular and very high temperature, violent delirium and coma, the presence of leucin and tyrosin in the urine, and finally the cutaneous hemorrhages and hematemesis, make a clinical picture that warrants, in my opinion, the diagnosis of acute yellow atrophy of the liver.

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INFECTIOUS JAUNDICE.

BY W. H. WASHBURN, M. D., OF MILWAUKEE.

Professor of Principles and Practice of Medicine and of Clinical Medicine in Wisconsin College of Physicians and Surgeons; Physician to St. Josephs Hospital; Pathologist to Johnston Emergency Hospital.

The importance of the liver in the animal economy has always been sufficiently recognized. Its great size, in proportion to the other glandular structures of the body, was alone sufficient warrant for the conclusion that its offices were of great consequence. But it was for a long time supposed that its most important function was the part it plays in the processes of digestion. With the development of our knowledge in physiology, however, the fact was soon established that while the bile does aid in the emulsification of fats, it has no action at all upon the nitrogenized food-elements, or upon carbohydrates, and hence the part played by the bile in the digestion of food is an exceedingly small and comparatively unimportant one. More important by far are its assimilative functions, in the discharge of which it modifies nearly every product of digestion that is brought to it from the gastro-intestinal canal by the portal blood. And not only does it do this, but it also acts upon, modifies and changes such secondary substances as leucin, tyrosin, lysin, lysantonin, etc., which are brought to it from the intestinal canal, transforming them into urea, or possibly, as in the case of the amido-acids, converting them into other and more complex substances.

The glycogenic function of the liver is also to be mentioned in connection with its assimilative functions.

This organ, standing like a sentinel at the portals of the general circulation, exercises also a protecting influence against the introduction into the body of any deleterious substance. The fact has long been commonly known that most drugs administered by the stomach are demanded in larger

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doses than when administered hypodermically, and the reason of this is, in part, that in passing through the liver the active principle of the drug is partially neutralized. This is particularly true of such vegetable poisons as morphin, strychnin, etc. During the past few years the fact has been fairly well established that the liver plays a very important part in recovery from acute infectious diseases, removing from the blood and conveying to the intestinal canal micro-organisms and their products. Its offices in this connection are particularly to be noted with respect to diseases which specially involve the gastro-intestinal canal, as typhoid fever, where the pathogenic micro-organisms are in close relation with the radicles of the portal system. In such diseases micro-organisms are, not uncommonly, separated from the blood by the liver-cells and carried in the bile-current into the intestinal canal to be eliminated from the body in the fecal evacuations.

Besides these functions of the liver, it plays a part as an excretory organ which is an exceedingly important one, and as such its offices are not confined to the excretion of pigments formed from hemoglobin, but extends to the elimination of bile-salts and cholesterin, certain drugs and poisons, as well as some of the poisonous by-products of digestion.

This very brief and crude statement of the offices of the liver indicates that its functions are extremely numerous, varied, and complex, and we are accordingly to conclude, *a priori*, that upon the efficiency with which its functions are performed will the health of the individual largely depend.

In view of the very frequent occurrence of infectious processes in the animal body, and the part played by the liver in the elimination of infectious materies, affections involving this organ, in the course of such diseases, are not infrequent events. We thus have jaundice occurring in the course of malarial fevers, pyemia, typhoid fever, typhus fever, scarlatina, in which cases the symptom is due to a sequence of

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events in the liver analogous with what occurs in the kidneys in connection with the same diseases.

CASE 1.—C. J. L., aged 24 years, in the fall of 1891 had an attack of typhoid fever which ran an uneventful course until complete defervescence had occurred. The duration of the febrile period was twenty-two days. After a period of apyrexia of four or five days duration there was a slight chill with a rise of temperature, the mercury reaching 103.7° F. within twenty-four hours. This occurrence gave rise to the fear that a relapse had begun. In the meantime the skin and conjunctivæ exhibited a slight greenish-yellow discoloration, and the patient complained of tenderness on pressure over the liver, which was sensibly increased in size. The jaundice deepened, though it was not intense at any time, and bile was present in the fecal evacuations throughout. The symptoms gradually subsided and the temperature became normal at the end of six days, the jaundice disappearing soon thereafter.

CASE 2.—Miss C. C. W., aged 29 years, in February and March, 1893, had an attack of typhoid fever in which the pyrexial period was of twenty-three days duration, there occurring no complications or unusual events. On the eighth day after the temperature had remained normal throughout the twenty-four hours there was a slight chill followed by a rise in temperature to 101.8° F. Jaundice developed within the next twelve hours, the discoloration being of moderate intensity. There was decided increase in the area of hepatic dullness and the tenderness on pressure over the liver was so great that for a time the formation of an hepatic abscess was feared. The fecal evacuations showed the presence of bile in the intestinal canal, and there was but slight evidence of the presence of bile pigments in the urine. The whole disturbance gradually subsided, the tenderness disappeared, the liver returned to its normal size, the skin assumed its normal color, and the pulse and temperature were natural at the end of a week.

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CASE 3.—Mrs. S. This woman was a patient of Dr. P. H. Jobse, to whom I am indebted for the notes of the case. She was admitted to the Presbyterian Hospital in August, 1897, for an operation for the radical cure of a hernia. Operation performed on August 25th, at 7:30 o'clock A. M., patient in good condition. Complained excessively of nausea following the operation and on the next day. Temperature on the 26th rose to 101.2° F., vomiting continued. On the 27th the vomiting continued and the patient was observed to be jaundiced. The mind became dull and by the 28th the patient was delirious and having involuntary evacuations from the bladder, the bowels being constipated.

The administration of calomel resulted in the evacuation of excessively fetid feces. Fearing infection through the wound, the stitches were removed but the wound was found to be perfectly healthy and aseptic.. On September 4th, the temperature was again normal, and the skin had nearly regained its natural color. The bowels, had, in the meantime, been unloaded of an immense amount of excessively fetid fecal matter which showed, however, the presence of bile in the intestinal canal.

CASE 4.—Mrs. R. E. A., aged 22 years, was taken sick December 11, 1897; there was a marked chill with a rise of temperature to above 105° F. The cause of this explosion was found to be a miscarriage at the third month. The fetus was in an advanced stage of decomposition. Patient removed to the Presbyterian Hospital where the uterus was thoroughly emptied and irrigated. The temperature rapidly fell to the normal, where it remained for twenty-four hours. At the end of this time another chill occurred, and the temperature rapidly shot up to above 106° F. Fearing that there was a further nidus of infection in the uterus, this organ was thoroughly curetted, irrigated and packed with iodoform gauze, sufficiently loose to provide for perfectly free drainage. Scarcely any reduction in temperature followed this pro-

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cedure, and the gravest fears were entertained as to whether the uterus were not itself involved in an infective process. About this time it was noticed that there was a yellowish-green discoloration of the conjunctivæ and skin, of only moderate intensity.

There was slight increase in the area of hepatic dullness with well-marked tenderness on pressure. The fecal evacuations contained bile throughout. The temperature ranged from 103° F. to 105° F. for fours day, at the end of which time it rapidly fell to the normal with coincident amelioration in all the other symptoms and the disappearance of the jaundice.

CASE 5.—Mr. J. B., aged 41 years, farmer. This case was seen in consultation with Dr. H. A. Albers who has very kindly allowed me to use his notes of the case. This patient, in previous good health and of good family history, was taken sick on January 23, 1898. The symptoms were rather indefinite at first. The temperature ranged above 102° F., and jaundice appeared in the course of a few days and this symptom became a marked feature of the case. The liver was increased in size, as was also the spleen, there being slight tenderness on pressure over the liver. Delirium and subsultus tendinum developed about the eighteenth day of the disease. Bile was present in the stools at all times during the course of the disease. Improvement became very marked on February 19th; the liver decreased in size as did also the spleen, the jaundice nearly disappeared, temperature became normal, and the patient was up and about the house. On March 9th there occurred a chill, with a return of fever, the temperature reaching 103° F., and above, the jaundice rapidly returned, accompanied by delirium and increase in the area of hepatic dulness. The case ended in death on March 17th.

Unfortunately it was not possible to secure an autopsy so that the real morbid conditions in the abdominal cavity can never be absolutely known.

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CASE 6.—Mrs. J. I., aged 49 years. This patient was taken sick on April 4, 1898, with an attack of pseudo-membranous enteritis, a disease from which she has suffered several attacks within the past four or five years. On April 6th she had a chill of short duration, which was followed by a rise in temperature, the mercury reaching 102.8° F., within a few hours. At the time of my first visit a distinct yellowish discoloration of the skin was observed, and this color deepened until the jaundice became very well-marked indeed, almost intense. There was some pain in the right hypochondriac region, which was increased on pressure, but there was no appreciable increase in the size of the liver. Bile pigment appeared in the urine for a few days, though in comparatively small amounts, and the fecal evacuations did not at any time show the entire absence of bile in the intestinal canal. The primary disease, the pseudo-membranous colitis, lasted three days, but the jaundice persisted for more than a week after the complete disappearance of the intestinal disturbance, the temperature remaining above 101° F. for all this time.

These cases illustrate fairly well the most essential features of the form of disease under consideration, both as to etiology and clinical history.

The jaundice in these cases was rather mild, except in the case that ended fatally, and in that case the jaundice reached a degree commonly attained in the jaundice of obstruction. The mildness of the jaundice in these cases would seem to indicate that only a part, and possibly only a small part, of the bile secreted was absorbed, the result being a more or less marked yellowish discoloration of the skin and conjunctivæ. That only a part of the bile was absorbed into the blood is further established by the fact that bile appeared in the fecal evacuations of all these patients, and there was but a very slight indication of bile pigment in the urine. These points are in striking contrast with the clinical characters of jaun-

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dice from obstruction of the common duct, either as a consequence of the impaction of a gall-stone, or from ascending catarrh from the duodenum.

Moreover, in all these cases there was another feature which was in striking contrast with the jaundice of obstruction, and that was the very decided constitutional disturbance that developed. In the mildest forms of infectious jaundice, there may be so little constitutional disturbance as to be scarcely observable, and such a case might readily be indistinguishable from catarrhal jaundice of intestinal origin.

But while this may be the case in exceptional instances, constitutional disturbance is a very marked feature of the disease.

CASE 3 represents a rather mild form of the disease so far as constitutional symptoms are concerned, while Case 5 represents the most severe, being characterized by fever, dry tongue, subsultus tendinum, delirium, in fact the "typhoid state", and terminating in death.

As to the etiology, it may be said that in the majority of cases there is evident disturbance in the intestinal canal, as is indicated by diarrhea or extreme fetor of fecal evacuations, but in some cases the seat of the infection is not so well established. In the cases here detailed no seat of infection could be determined in Case 5, and in Case 4 the uterus was the seat of infection, apparently, rather than the intestinal canal.

The pathogenesis of this form of disease has been studied somewhat extensively in recent years and what has been determined seems to warrant the conclusion that the infectious material in its passage through the liver and especially in its passage through the bile-ducts, is the offending substance; that by its presence in the bile-ducts or in the capillaries about the bile-ducts, an angiocholitis or a periangiocholitis is initiated. As a consequence of such inflammation the caliber of the bile-ducts is lessened, and the bile itself is rendered unusually

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viscid, and hence it results that there is an obstruction to the outflow of the bile. As a result of this combination of circumstances we have absorption of some bile and consequent jaundice, while at the same time bile appears in the fecal evacuations.

This is a pathologic process which is, in many respects, similar to what takes place in the kidneys in certain infectious diseases in which the morbific materies is specially injurious to these organs, as diphtheria, scarlatina, and measles.

Some writers have thought that jaundice as it occurs in connection with such diseases as have already been mentioned, should be distinguished from that which arises in such an independent manner as to be regarded as almost specific, as "Weil's disease," "epidemic," "febrile," "infectious," or "malignant" jaundice, and acute yellow atrophy of the liver. Yet when due regard is paid to all we know of the etiology and pathology of these various diseases, there appears no sufficient ground upon which to base such a distinction.

The gradation between the mildest and the most malignant of these cases is such as to merely indicate that there is a corresponding gradation between the virulence and amount of the morbific agent operative in each case, but there are no clinical or pathologic facts warranting the conclusion that there is any essential difference between them.

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CARBONIC OXID POISONING: IS THERE ANY RATIONAL TREATMENT FOR IT SHORT OF BLOOD TRANSFUSION?

BY J. R. BARNETT, M. D., OF NEENAH.

The literature of poisoning by this gas is so scanty, at least in the average private medical library, that I count upon the interest of this Society in the report of two recent cases, both ending fatally. Indeed, I might count on more than this if many members happen to have had cases, and to have rummaged their text-books and current journals with no more helpful results than I have met; for their interest would quicken into a lively hope that a satisfactory, perhaps an affirmative, answer could be given to the question just read. But this paper is to solicit an answer, not to give one.

My patients were girls of 7 and 9 years of age. They fell to my care five or six days after the inhalation of stove-gas in such moderate quantities that up to the end of this time they were but little sick, with headache and varying nausea. There was no change of temperature till towards the last; and in general terms it may be said that symptoms were such as often occur and persist a few days in mild gastric disorders, or as prodromata of some of the continued fevers.

But when I first saw them these symptoms, especially in the older child, had grown severe and even threatening. The stomach was then wholly uncontrollable, not even a swallow of water being retained; and vomiting was frequent and exhausting when nothing at all was given. The pulse was weak, rapid, and irregular—110 to 130.

With both, the headache was agonizing, but the younger had a circulation varying from 60 to 70, which did not hasten till towards the last, when, very singularly, the pulse

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of the former fell below the normal—the two exactly reversing conditions in this respect.

Constipation was present in both, and the kidneys were rather inactive until late in the disease. Respiration varied. It was usually quiet and a little hurried, but sometimes became rapid and gasping—notably with the younger.

The lips and mucous surfaces continued red—almost too red, it seemed—a startling companion to the symptoms of asphyxia.

And now, as the histories of the two change for the time, I shall speak of them separately. In the older patient the incoercible headache and vomiting, and the rapid circulation, continued and in growing degree, in spite of stimulants and food per enema, and by the eighth or ninth day respiration and circulation were so weak and irregular that death seemed imminent.

At this point the subcutaneous injection of rather more than a pint of normal salt-solution, preceded by a copious watery evacuation of the bowels induced by a saturated magnesium sulphate enema, brought a radical change, which for nearly a week promised recovery. Even before the completion of the hypodermoclysis the heart had steadied notably in rhythm, and slowed to about 110. Nausea and headache nearly ceased, and for the first time the necessary supporting treatment could be borne by the stomach, although the thought of food was so repugnant to the patient that it was continued mostly by enema. A week later a sudden change for the worse occurred. It was like a bolt from the blue; for no symptom, except that of great weakness, disturbed our calm belief that she was getting well. One day she was not visited, and retention of urine occurred and continued thirty-six hours. The catheter removed a pint and a half, and the following morning three pints. Then there was noticed a peculiar rigidity of the abdominal walls, such as attends a peritonitis, but there was no other evidence of such an in-

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flammation. At the same time marked dullness began to be observable, although she would answer questions correctly, but with hesitation. There was slight intermitting delirium, and a restless tossing of the left arm. Sight became somewhat impaired. Pupils were slightly dilated, but responsive to light. Pulse slowed to about 70. Five days before death temperature, before normal, rose to 101° F., and at the last to 103° F. Her sickness lasted three weeks.

Her sister lived a day longer. This one began to show grave symptoms on the twelfth day. Excepting her slow pulse—60 to 70—nothing about her condition had given grounds for great anxiety. Pupils were a little dilated, but equally, and sensitive to light. Now she showed signs of failing vision and mental dullness. Her pulse—still at 70—became so irregular and feeble that the normal saline infusion was resorted to, three-fourths of a pint being used. The circulation steadied at once, but cerebral symptoms steadily progressed. In three or four days there was paresis of the left orbicularis palpebrarum, and the symptom extended somewhat generally, the left side being most affected. The left arm was seldom moved unless the surface was irritated, as by a pinch or scratch of the skin. No point of anesthesia was found. There was no muscular stiffness. From time to time she would groan as if in pain, but when questioned she would say that she had no pain. It was reported that once she had the appearance of spasm, accompanied with screaming, but the description was too vague to be depended upon.

Two days before death she was unable to swallow, and failing vision progressed to total blindness. Meantime the pulse had risen rapidly to 130, but the temperature never rose more than a degree.

The history of these cases diverges widely from the typical record of carbonic oxid poisoning. Or is there a typical record? Cases doubtless differ greatly according to the rapidity of asphyxia, the length of exposure to the gas in vary-

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ing quantity, and, above all, according to the varied admixture of carbon dioxid. Careful experiments seem to have proved that the effects of the latter alone last only from fifteen to forty minutes. If this be present in large quantities, asphyxia may be profound and seemingly fatal, and the patient nevertheless make a rapid recovery. This means that oxygen in living quantities has been excluded from the blood but partially and temporarily, and that that fluid is restored to its normal oxygeniferous functions promptly and completely.

With the monoxid it is different in all respects. The affinity of that gas for hemoglobin is said to be 140 times that possessed by oxygen; and the union, once affected, is always slow and difficult, and sometimes impossible of divorce, and the premonitory stage may be too insidious to be noted. Two-tenths of one per cent. vitiates the air to the danger-point, but not beyond the point of comfortable respiration. With a seeming mild intoxication, symptoms of a progressive asphyxia, lasting a few or many days, may prevail, gradually disappearing or culminating in those of fatal oxygen starvation. Or, as in my own cases, there may be superadded cerebral conditions which cannot quite be accounted for by deoxygenation of the blood alone; cases where the original toxemia has so affected nutrition and metabolism, or the processes of excretion, or all together, as to produce a mixed and graver intoxication. The prompt effects of artificial elimination would seem to prove something of this kind, whereas such effects, while possible, would not be expected if it were sure that the single morbid condition present is a crippling of the oxygen-carrying capacity of the red globules. It has already been seen that the infatuation of these bodies for the monoxid is hopeless. Is it likely that any mere blood-washing would cast out the intruder and restore the old union? Is it not logical to conclude that the only rational and effectual way is to draw off as largely as possible this functionless circulating fluid by free venesection—and replace it by an equal vol-

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ume of capable, oxygen-carrying blood—by venous transfusion? This has been done successfully in a few cases. But, also, cases have recovered after hypodermoclysis, and many others with substantially no treatment.

Recuring finally to my own cases, the feeling haunts me that they would have done better, and might have recovered, if the saline treatment had been begun earlier and repeated as conditions required. But I was deluded by the partial recovery into thinking that the stomach, now grown tolerant, might, just as well as the subcutaneous tissues, supply the necessary fluids to the body; a reasoning that took no account of that fluid once in the body, whether it was excreted, or whether in its excretion it carried with it its proper burden of waste and toxic material. As a matter of fact there is, or is apt to be, a serious crippling of two very vital functions—stomach absorption, and elimination, especially by the kidneys, skin, and lungs. In fact the stomach is revolutionized, and becomes changed from an absorbing to an eliminating organ; thus serving notice of the defective state of the kidneys, and that general elimination is doubtless more or less in abeyance.

Bearing this point in mind, in instituting vascular irrigation it is evident that the effluent stream should be considered, quite as well as the affluent. We want to wash the blood out, not simply to dilute it, and to this end we want to see that the outflow bears some relation in quantity to the inflow; and since we cannot turn with confidence to normal eliminative processes, especially those distinctively excretory, we must invoke those more or less purely physical—in short simple exosmosis, for the most part. To this end the hypodermoclysis should be preceded, or at least accompanied, by the dense saline *clyster*—not necessarily saturated—preferably of the sulphate of magnesium or sodium. Common salt will do in emergency, but experience shows that this, when used in adequate strength, is too irritating to the rectum. Glycerin may be added; but it is doubtful if it will hasten the abstraction

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of fluid, since its affinity for water is already pretty well satisfied by the saline solution.

POSTSCRIPT.—The very latest utterance on the subject of carbonic oxid poisoning is by Wyatt Johnston, in the American Year-book of Medicine and Surgery, 1898, just out. He gives eight lines to the subject, and winds up with this significant statement: A very full discussion of the whole subject of carbon monoxid took place at this congress (Brussels Medico-Legal Congress, 1897), but the statements on many important points still remain irreconcilable.

This pregnant remark of Johnston alone, it would seem, would justify challenging the attention of this Society to an out-of-the-way subject, even in the desultory manner of the foregoing paper.

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RETROGRESSIVE METAMORPHOSES AND DISEASES OF THE CLIMACTERIC PERIOD, ADVANCED LIFE, AND OLD AGE.

BY A. IVINS COMFORT, M. D., OF NATIONAL HOME.

The duration of human life, according to Wagner and others, is divided into the following periods:

First—Infancy: from birth to the seventh to tenth month.

Second—Childhood: from the first to the second dentition.

Third—Boyhood: from the second dentition to puberty.

Fourth—Adolescence: from puberty to the twentieth to twenty-fifth year.

Fifth—Early Manhood: from the twenty-fifth to the forty-fifth year.

Sixth—The Turning Time, or Climacteric Period: from the forty-fifth to the sixtieth year.

Seventh—Advanced Life: from the sixtieth to eighty-second year.

Eighth—Old Age: from eighty-two to one hundred years.

The various definitions of the periods of life are beset with numerous exceptions; some men are prematurely old at forty, others are young at sixty, and so all classifications are but relative in their significance.

We purpose to consider in this paper from a pathological standpoint the three later periods of human life.

Between forty-five and sixty years men usually attain the acme of their physical development; women ten years earlier. It is known as the grand climacteric period, or the period of middle life.

Up to this period the skull may increase in size, chiefly anteriorly; the brain up to this period, particularly in persons of intellectual pursuits, has scarcely attained its maximum size and weight; it subsequently undergoes a gradual involu-

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tion, the neuroglia is increased, while the brain cells are diminished, but corpora amylaceæ are deposited in increasing numbers throughout its tissue. From birth onward the progressive increment of growth diminishes. The metabolic activity of the body at first was able, not only to restore the waste tissue, but to elaborate new material for constructive purposes. Now, in advanced life and old age it is imcompetent to accomplish either of these purposes, hence the earlier progressive increment becomes a decrement.

At this period a man is usually conscious that he is growing old; prefers some one else to tie his shoes rather than tie them himself; he is disinclined to stoop; prefers riding in a carriage or street-car to riding on horseback; he notices that his complexion is losing its freshness; the skin is dry, dull, hard, and inelastic; he sees increasing wrinkles in his face, and multiplying numbers of gray hairs; he feels the sand in his joints; his vision is failing, from the flattening of the globe, the clouding of the media, the flattening of the lens, the loss of visual accommodation and the obtunded acumen of the retina; hearing is dull; cardiac force wanes, with waning systemic vigor; the lungs lose their resiliency, the lung tissue becomes dense and inelastic, and the respiratory capacity diminishes. At this period of life acute inflammations are less frequent and less violent, and though to the exanthemata and infectious diseases our race appears to be comparatively immune, the neoplasms, both malignant and benignant, especially manifest themselves, such as epithelioma, scirrhus, encephaloid, colloid, the sarcomata, and a long catalogue of homologous and heterologous new formations.

At this period of life many individuals become painfully sensitive to sudden thermal and hygrometric atmospheric changes, and the various neuroses and rheumatoid arthritis manifest themselves.

Functional womanhood ceases at the fifth decennium, but the decline of functional manhood is gradual, and it termin-

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ates only when disease puts an end to a ripe old age. After the climacteric period the prime of life lapses into old age. To walk with a shuffling gait and heavy, short, and inelastic steps, three to six strides to a metre, leaning heavily on a cane, stopping at short intervals to look back, treading on the whole base of the foot with toes everted, the sole and heel striking synchronously, with shoulders stooping, body inclined forward and knees and elbows flexed, is characteristic of feeble old age. "*Senectus ipsa morbus insanabilis.*" On such an one senescent changes have laid their wasting hand. As a consequence of these changes the height and weight of the human body is diminished, not only as a whole, but the individual organs of which it is composed undergo atrophic change. The dynamic coefficient of the skeletal muscles diminishes rapidly after forty years of age, and what is true of the muscles of animal life is true also of the muscles of organic life, of the striated, as well as of the non-striated muscular fibres.

The heart, though it may not diminish, but on the other hand take on compensative hypertrophy, ultimately possesses less and less force, suffers attenuation of its walls with dilatation. The muscular coat of the bowels attenuates also, hence the usual habitual constipation of the aged. In the digestive tract the villi and muciparous and other glands undergo atrophy, hence the diminution in quantity and potency of the digestive fluid.

The prostate gland, on the other hand, after fifty-five years of age, usually undergoes enlargement in consquence of fibrous growth among its normal cell structures, the so-called hypertrophy of the prostate.

The walls of the bladder are thickened while its cavity diminishes. The speen and lymphatic glands undergo a remarkable diminution in weight and volume. The latter sometimes wholly disappear. Frequent micturition is very common in advanced life; few men above sixty pass seven unin-

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terrupted hours in bed without it. Dr. Rush, the Sydenham of American medicine, regarded the necessity for frequent micturition among the earliest symptoms of senile decline.

While the integument is denser and harder in advanced than in adult life, it is thinner, and everywhere an indurated condition of every tissue presents itself in striking contrast to the cellular vascularity, elasticity, and pliancy of youth. But a progressive atrophy of almost all the tissues is an almost universal structural characteristic of old age. We don't know why, when the human body has attained the acme of its physical development, it should decline. We cannot say why, when a counterpoise between a constructive metabolism and a retrogressive metamorphosis once exists in the human economy, it should not remain, and life and health and physical vigor become perpetual. But the case is otherwise.

The phenomena of development, maturity, and decline pertain to all living organisms, and to man as well as to the bacteria and parasites that infest his body, and everywhere the process of physical development has its counterpart in "involution," or the progressive senile atrophy of the tissues and organs. In advanced life there is a decrease of height and body-weight as well, except in those whose climacteric has been marked by an increase of adipose tissue, an occurrence more common among women than among men.

The following organs undergo marked atrophic change; the bones become thin, fragile, and deficient in bone cartilage; the muscles waste; the gums recede from the teeth; the teeth fall out; the alveolar processes are absorbed; and, mark the change in the conformation of the lower jaw of infancy, adult life, and old age. Other skeletal changes also occur, though less striking. The brain and spinal cord undergo simple senescent atrophy to a marked degree; so also the nerve trunks, hence the delay in the transmission of sensory impressions and motor impulses. The mammary gland, and the ovaries, and testes, to a less extent, undergo simple atrophy, so also

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the uterus, while its congener, or correlative, the prostate gland, as has been already stated, undergoes hypertrophy, very rarely atrophy. The kidneys usully atrophy but rarely retain their normal size and weight.

Two tissue-changes characteristic of old age are the so-called fatty and calcareous degenerations; these changes are nowhere more manifest than in the arteries, which, as a consequence, lose their elasticity and become rigid tubes with obstructing intima and diminished lumina, thereby becoming niduses for fibrinous thromboses or plugging emboli. The coats of an artery, weakened by atheromatous degeneration, may split and bulge and dilate by internal pressure, giving rise to aneurisms; to these lesions the cerebral circulation is especially prone, hence arise cerebral aneurism, brain-softening, and intracranial hemorrhage with resultant paresis. The occlusion of arteries elsewhere from the same cause results in senile gangrene. A similar change, and one that impairs tissue nutrition, is a shrinking, and even an obliteration of the capillaries in almost all histological structures. The walls of the vessels, the meninges of the brain, the capsule of the liver, and the capsule of the spleen. become opaque, thickened, and indurated by degenerative change. The arteries fill readily after a full meal, and arterial tension is greatly increased; the converse is true after fasting.

The quantity of blood in advanced life and old age is diminished; so also is the number of the red corpuscles and other solid constituents; its coagulability is increased; it is poorer, paler, and more watery. The blood-current in the adult, completed in twenty-two seconds, requires a much longer time in old age in consequence of the inelasticity of the arteries, arterioles and capillaries; hence the slower oxidation of the blood.

Not infrequently in advanced life when convalescence has been fairly established after a severe attack of an acute disease, *e. g.*, pneumonia, or an acute inflammatory fever, the

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processes of atrophy and *destructive* metabolism are arrested, and convalescence progresses and the metabolic activity of former years is again restored in the physical economy, the individual attains a degree of health and mental and physical vigor equal to that of the prime of life; his former body-weight is regained, and the ashy hue of the senile face is exchanged for the ruddy hue of former years. Nor is this all, histological rejuvenescence is complete, functional manhood is restored (and without the aid of Brown Sequard's elixir of life), the individual regains the health of former years, and life is prolonged to extreme old age. Usually, however, without regard to rejuvenescence after recovery from an acute disease, the strong of both sexes, with even moderate hygienic, dietetic, and sanitary precautions, and in many cases without them, retain to a good degree till the seventy-fifth year, their digestive powers, and mental and physical vigor as well.

In consequence of the diminished excitability of the vascular and nervous systems, and the obtunded acumen of the thermogenetic and thermotaxic nerve-centers in advanced life and old age, acute diseases are clinically less manifest in their symptoms and not so easy of recognition. Diseases at this time of life assume the adynamic form and become chronic. A slight morbific influence may induce a high temperature in preadult life which proves ephemeral in character and subsides *sua sponte* and without treatment; on the other hand, a grave malady in an aged person may be ushered in with but slight change in the quality and frequency of the pulse and only a moderate fever; hence the latent pneumonia, latent pleurisy, and latent peritonitis in the aged. How insidious and how completely masked are some of the forms of Bright's disease! Acute phthisis, so common in early life, is rarely seen in persons of advanced years. Few, if any, diseases are met with in advanced life only; on the contrary, many diseases of early life are not found in old age.

No tissues of the body manifest functional decline earlier

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than the muscular and nervous, and with failure of function may be inferred structural decay, and the prolongation of life depends upon these essential factors; the maintenance of the circulation, the access of air to the hemoglobin of the blood, and the functional activity of the respiratory centers. The failure of any one of these three factors results in death. The aphorism of Bichat that death takes place by the brain or by the heart or by the lungs, is quite comprehensive, but most diseases of the brain, such as embolism, thrombosis, intracranial hemorrhage, apoplexy, cerebral aneurism, and cerebral softening, are secondarily derived from diseases of the arteries and arterioles so that, after all, longevity is a vascular question. The adage that a man is only as old as his arteries is literally true, and by far the greater majority of men, either primarily or secondarily, meet death through this portal, and deaths from diseases of the brain not derived from the circulatory system are few.

The degeneration taking place in the senile heart in consequence of the fatty metamorphosis of its muscular fasciculi and their ultimate absorption, constitutes the typical, dilated, weak, leaky heart of advanced life with its attenuated walls and enlarged cavity; this condition is aggravated by prolonged and violent exertion; constituting heart-strain, by valvular disease, and the too free indulgence in alcoholic stimuli.

With the dilated heart occurs also dilated auriculo-ventricular orifices with incompetency of the auriculo-ventricular valves, though a constriction of these orifices sometimes occurs from atheroma of the cusps and rings. With a dilatation of the heart, as before stated, occurs, also, and from the same fatty metamorphosis, a dilatation of the arterial system and particularly the aorta, which sometimes more than doubles its usual caliber. The pulmonary artery undergoes a corresponding dilatation. Cardiac dyspnea of varying degrees of intensity, is the usual symptom of fatty or dilated heart, and

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an endless variety of cardiac murmurs and rhythms are encountered in ausculting the senile heart.

In examining 171 veterans for admission to the Northwest Branch of the National Home, sixty-nine were found to be suffering with diseases of the heart: a ratio of over 40 per cent., or $403\frac{5}{10}$ per thousand.

Of the diseases of the respiratory system none are more common in old age than chronic bronchitis, constituting the peripneumonia notha of older authors. Asthma, both cardiac and bronchial, is not uncommon after the fifth decennium, and when once an individual in advanced life becomes a victim to bronchial asthma it follows him like an avenging Nemesis to the grave. Scarcely less frequent is emphysema of the lungs, and going hand in hand with it is asthma. Associate with these two diseases dilatation of the right heart and we have a trio strikingly familiar in the nosology of senile diseases.

After a sudden cold-wave in December, 1897, three veterans entered our hospital within a few days of each other. The clinical thermometer indicated a slight rise of temperature, and the pulse and respiration-rate were slightly accelerated; they were free from pain, were without cough and expectoration, and, in short, presented no subjective symptoms of any grave disease, but physical signs revealed the existence of a latent pneumonia. With even a slight and illy-defined indisposition in an aged person with a slight rise of temperature and accelerated respiration, it is well to look for a lobular pneumonia, particularly after exposure to cold, or cold and dampness. The senile pulse is of little avail in the diagnosis of disease.

The circumferential expansion of the chest-measurement in a young adult male subject, from expiration to inspiration, is from 7.5 to 12.5 centimeters, 3 to 5 inches; but, owing to the co-ossification of the costal cartilages and the inflexibility of the ribs of a senile subject, the expansion of chest-meas-

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urement from expiration to inspiration is from 2.4 to 3.7 centimeters, from 1 to 2½ inches. From this it is evident that costal respiration in the senile subject is practically abolished, and this important vital function becomes almost wholly diaphragmatic.

Of 427 veterans examined for admission to the National Home, thirty were found to be suffering with pulmonary tuberculosis, a ratio slightly in excess of 70 in 1,000.

In the consumptive ward of the hospital of the Northwestern Branch of the National Home lay four veterans suffering with tuberculosis pulmonalis in its third or most advanced stage. Under the dry, balmy atmosphere of the summer months their condition improved, the night-sweats ceased, their appetites partially returned, the urgency of their cough abated, and they were gaining, to a limited degree, body-weight and physical strength. After the first cold-wave of autumn with our lacustrine atmosphere, they all became suddenly worse, and knew the cause and my prognosis. They had heard me speak of the benefits to be derived from a change of climate but it presented obstacles, to them insurmountable. Within sixty days three of the number died, the fourth took a furlough, though scarcely able to walk, removed to Colorado and is still living.

Of diseases of the digestive organs, gastro-enteric atony is by far the most prevalent, and may be attributed to atrophy of the muscular coat of the digestive tube and deficiency of the digestive fluids, and constipation and flatulence are the legitimate consequences of such a condition. The senile subject learns by painful experience to eliminate from the regimen of his diet such vegetables as cabbage, turnips, rutabagas, carrots, parsnips, beets, radishes, etc. Many of the veterans of the Home assure us that they have not eaten meat for several years, and the ingestion of even a moderate meal of beef or pork, mutton or veal, is attended with intense suffering. On the other hand, eggs, milk, farinaceous food and fruit, con-

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stitute the *summum bonum* of senile dietetics, and the close resemblance of the menu of infancy and extreme old age is particularly striking; in short, we come into the world eating "pap" and we go out of it eating "pap." Nevertheless, with a suitably selected regimen of diet, a good appetite and fair digestion are usually among the enjoyments of advanced life and old age.

With the marked diminution of the thickness of the skin, and especially its papillary layer, with its impaired nutrition, we are not surprised to find a large variety of skin diseases such as alopecia, psoriasis, pityriasis, ichthyosis, eczema, herpes, impetigo, lichen, prurigo, roseola, urticaria, and occasionally an inveterate pruritus, no cause or eruptive symptom of which can be discovered, and it most emphatically baffles all treatment.

The various forms of Bright's disease exist in advanced life and old age, as in other periods of life. We occasionally find amyloid degeneration of the kidneys. The smooth white kidney is much more common, but the chronically contracted kidney in a condition of diffused interstitial nephritis with progressive atrophy of the tubules; and an increase of the intertubular connective tissue, constitutes the especial senile kidney, though it is not, like the "gouty kidney", necessarily associated with hypertrophy of the heart. The extreme atrophy sometimes attained by the contracted kidney is very remarkable. I have observed specimens in the *post-mortem* chamber not exceeding five centimeters, two inches, in length. The quantity of urine in the earlier stages is copious, often exceeding two or three liters, or two or three thousand grammes, with a low specific gravity, 1005 to 1015; in the later stages of the disease the urine becomes scanty, and is usually albuminous, though sometimes devoid of albumen. The quantity of urine voided in old age by persons in perfect health, often does not exceed 15 or 20 ounces, 450 to 650 grammes daily, and its specific gravity is correspondingly in-

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creased—1028 to 1035. A glycosuria, though not constantly present, is frequently encountered among the veterans of the Home, though it is rarely attended with the graver symptoms of diabetes.

Arthritic lesions are especially prevalent in advanced life and old age, particularly those of chronic rheumatoid arthritis, or arthritis deformans, multiple arthritis deformans, and the various arthritic affections associated with chronic rheumatism.

Gout is not an American disease, nor is it strictly a disease of old age, and when it exists in old age it does so by virtue of having existed in adult and middle life.

During the service of a young medical officer at the Home a few years ago, cases of gout were very numerous, but since his labors have ceased cases of gout have disappeared. Under the administration of a former surgeon, deaths from old age and chronic alcoholism were ranked in the numerous class; since he tendered his resignation deaths from these causes almost never appear upon our records.

Death may occur from old age, *i. e.*, senile atrophy, or senile marasmus, but such cases are extremely rare; almost invariably some lesion may be found if diligent search is instituted.

In considering the nosology of diseases, due allowance must be made for what our friend, Surgeon John S. Billings, is pleased to term the "personal equation of a medical officer."

The question of death from old age is philosophically considered by Oliver Wendell Holmes in his poetic allegory, "The Deacon's Masterpiece, or the Wonderful One-Hoss Shay," in which it is contended that the one-hoss shay (the human body) if perfect and sound in all its parts, will last one hundred years. I beg leave to quote one stanza of the logical lyric:

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"Now in building chaises I tell you what,
There is always somewhere a weakest spot;
In hub, tire, felloe, in spring or thill,
In panel or cross-bar, or floor, or sill,
In screw, bolt, thoroughbrace—lurking still,
Find it somewhere you must and will,
Above or below, or within, or without;
And that's the reason beyond a doubt
A chaise *breaks down* but *doesn't wear out.*"

Louis Conaro, an Italian writer upon dietetics, after failing in health at 60 years of age, by a strict regimen of diet regained his health and aspired to live to be 100 years old; he attained his 99th year when he died. He contended that by a carefully selected diet, in quantity not in excess of the requirements of the individual, any person of ordinary constitution may live to be 100 years old.

The average age of the veterans of the Northwestern Branch of the National Home is 62.5 years; their average age at death is 67 years, and the ratio of deaths per thousand is 44.04.

The number of deaths of veterans at the Home between 60 and 70 since January 1, 1890, is 332; between 70 and 80, 269; between 80 and 90, 63; between 90 and 100, ten. Total number of deaths since 1890 is 1,039.

The causes most deleterious to the health of persons of advanced life and old age, and attended with grave results, are:

I. Exposure to cold and dampness.

II. Abuse of alcohol and narcotic drugs.

III. The vice of over-eating and drinking and bolting into the stomach only partially masticated and otherwise unsuitable food.

IV. Insufficient sleep.

Ezra B. French, a veteran who recently died in one of the wards of the Home hospital, resented the idea of being called

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"old," declaring he was only seventy-six, and that his father died at the age of 110 and his grandfather at 116.

Gerocomy (geron, an old man, komeo, to take care of) is defined by Ogilvy as that branch of medical science which treats of the regimen of old men. Old age *per se* requires no treatment any more than any other period of life. Its diseases, however, are attributable to senescent degeneration, which it is desirable to avert as long as possible; and for the promotion of longevity many methods have been advocated, each of which has alike its individual cases of success and failure; as the functions of digestion, secretion and assimilation are feeble, the desired effect of drugs is only partially obtained. In consequence of the non-sensitive character of the mucous membrane of the digestive tract, cathartics, to be effectual, usually require to be given in full doses.

Phlebotomy is now rarely practiced upon persons in robust health, and is not tolerated by persons in advanced life and old age. The hemoglobin of the blood once abstracted from the veins is restored only partially in senile cases. Iron as a therapeutic agent is of but little avail as a restorer of the hemoglobin.

In consequence of the involution of the cerebro-spinal system and the diminution of the number of the brain-cells, a smaller quantity of alcohol than was ingested in the prime of life proves an intoxicant.

Feeble old people require nourishing food in quantity and quality adapted to their digestion and assimilation, with a moderate amount of stimulants, or without any, and the quantity of azotized food reduced to a minimum.

The most important hygienic precaution in caring for the aged is that the temperature in their apartments be maintained at one uniform degree, 22 C. or 72 F., as nearly as practicable throughout the year.

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BRAIN-TIRE.

BY JAMES MILLS, M. S., M. D., OF JANESVILLE.

What are the causes of this exhaustion in school work?

How can the teacher best detect it?

And how can it be overcome or prevented?

Within the limits of a short paper, it is impossible to do justice to this subject.

In order to develop a well-balanced mind, the physical condition, as well as the mental, should receive its full measure of attention. We cannot, with good result, separate these several lines of education for a moment, and when it is attempted, nature too soon asserts herself, and the man who has not received this "all around" training pays the penalty with a weak body, a wandering intellect, or a wavering moral character.

Every parent and every teacher should be strongly impressed that a "sound mind in a sound body" is necessary in all cases, if enduring results are desired or expected.

Are we now giving enough attention to these laws which relate to the physical well-being? Are our boys and girls growing up strong and beautiful, as youth should and can be?

The clear-eyed Greek knew how essential to true education is physical culture; and their beauty and grace of form have been the admiration and envy of succeeding generations.

First, let us train the muscles, that we may make them fully developed, strong, and healthy. From infancy to mature age, play is a boon to all workers.

The men of thought, as well as the men of action, double their efficiency by taking regularly helpful recreation.

We may easily quadruple the value of our school work by studying to keep pupils fresh in the operations of their minds.

They should not only know, but put into practice, the truth

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that proper food, plenty of oxygen, and frequent periods of relaxation in which to rest and change the activities of the brain, are of infinitely greater value to the child than the details of geography or history, or the memorizing of the rules of grammar or arithmetic, frequently drawn from principles not at all understood. Then, too, teachers and all others who have the direction of the intellectual and moral training of children, should have a clear and comprehensive knowledge of the laws and principles underlying and governing the development of the brain, as well as the mental and moral faculties of the child. They should know that the brain of the child, as compared with that of the adult, contains a larger percentage of water, is more unstable, more easily disturbed; and that as a consequence, long continued, monotonous work not only fails to strenghten the mind, but, on the contrary, weakens it, besides producing irritation of the brain, with a lowering of the vital powers and retardation of the physical growth. They should understand that the motor centers, which preside over and control muscular movements, act much as storage batteries; that is, they store up nerve-force, which is almost constantly being discharged in producing muscular movements.

We might just as well try to compel a normal, healthy child to stop breathing, as to remain quiet for any great length of time. The nerve-force, accumulating in its motor centers, has just as specific and important a function to perform as that which regulates the activity of its respiratory organs. Teachers should remember this fundamental physiologic truth, that the brain-centers are in an undeveloped condition.

Young children soon become fatigued, and so we make their periods of work very brief. These periods are lengthened as they advance in age. The fatigue-limit is a great practical study. Much may be done to keep pupils fresh by having easy work follow difficult work.

In this connection I desire to insist that, whenever the chil-

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dren of a class in their efforts to follow the recitation become tired, or whenever a strong effort of the will on the part of the teacher is required to keep their attention on the work in hand, it is time to stop. If this limit be exceeded, the unstable brain will be injured and infinitely more harm than good done.

The importance of relieving the strain on the brain and allowing it to equalize its energies; that is, permitting the stored-up nerve-force of the motor centres to discharge itself in muscular activities, while the higher brain-centers are resting and accumulating force to carry on their proper work,—this fact is being recognized by the best educators and physicians, who advise frequent periods of relaxation and play.

I do not believe that there is anything else like getting good oxygen into the lungs and securing the benefits of sunshine.

There can be no doubt but that great injury is done, where pupils are subjected to an everlasting grind of monthly examinations, term examinations, and annual examinations, and are continually being reminded that if they do not do this, or do not accomplish that, they will fail to pass and not receive their coveted promotions. I believe that when pupils are placed under such a system, they are worried, annoyed, and kept in a constant state of excitement from the time they enter the primary department of the public schools, up to that when the doors of the university are closed to them.

What are the causes in school work of such tired condition of the brain?

1. Inherited or congenital brain-weakness or instability. Insufficient food, causing impoverishment of the blood, which in turn produces weakness of the nervous system.

2. Improper food, or too large a quantity of it. This leads to disorders of digestion and assimilation, and produces ptomains or poisons, which, carried by the blood to all parts of the system, poison the brain, poison the muscles, poison every cell and tissue in the body.

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3. Insufficient outdoor exercise and play. This causes retention of broken-down tissue poisons, the accumulation of energy in the motor nerve-centres, which lead to restlessness and disturbance in the school, or the inhibition of the normal discharge of this accumulating motor nervous energy, this requiring a strong effort of the will, and the expenditure of much nerve-force, which should be used in quiet thought and study.

4. Failure to instruct the child as to the importance of attending to the calls of nature, or in many cases the refusal of the teachers to permit pupils to leave the room for this purpose. This causes constipation with retention of poisons in the system, and may lead to bladder and kidney troubles, and many reflex disturbances, which not only produce irritability of the brain, but weaken the mind.

5. Lack of ability on the part of the teacher to arouse and maintain the interest of the child in the subject and the recitation.

6. Too infrequent recesses and periods of relaxation, thus preventing the child from discharging the accumulated motor nerve-force and eliminating the constantly accumulating toxins.

7. Too long recitations, in which the young child is called upon to fix its attention on one subject for too great a length of time.

8. Unhealthful sanitary surroundings.

How can the teacher best detect this weariness of the brain?

By the restlessness of the child; by its lack of interest in the work; by its inability to confine its attention to, or comprehend the subject under discussion; and the dull, listless and pained expression on its face; by the loss of buoyant, mental and physical health, which attend such a condition; or by complaining of headaches and not feeling well.

How can this exhaustion of the brain be overcome or prevented?

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1. Make the sanitary conditions as nearly perfect as possible. No child can study well in a poorly ventilated room with impure air. Open the windows during recess.

2. Adapt the work to the age and to the physical, as well as the mental development of the child.

3. For young children especially, make the recitations short and maintain interest in the work.

4. Give all pupils frequent open-air recesses and periods of relaxation, thereby discharging stored-up motor nerve-force in muscular movements, eliminating accumulated toxins, and resting the higher brain-centers.

5. All school children should have an abundance of plain, nourishing, and unstimulating food, and plenty of sleep, and be guarded against late hours, attendance upon parties and all sorts of dissipations that lower their physical forces.

The physician is becoming interested in the schools, as at one time was the clergyman. As the physical basis, or at any rate the physiologic concomitants, of intellectual deficiences and moral defectiveness are coming to be more clearly understood, the physician's function as an instructor of teachers, and as an examiner of children in respect to their sight, hearing, touch, and symptoms of fatigue or illness, in respect to their temperamental characteristics and 'nervous' peculiarities, and in respect to their differentialities in age and sex, this function is in turn being more fully apprehended.

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ATONY OF THE STOMACH.

BY A. J. PATEK, M. D., OF MILWAUKEE.

Atony of the stomach is a common affection, yet a condition which—not recognized as a distinct disease requiring definite measures for relief—gradually passes into a stage in which treatment is of little avail. Because of its practical importance, then, I wish to say some words concerning this affection, its cause, symptoms, diagnosis, and treatment, and to cite a few illustrative cases.

The name "atony," though commonly used to designate this condition is, correctly speaking, rather inaccurate, since it means "an absence of tone."

This affection is, however, decidedly not of this character, and is better designated by the terms "hypotonia" (Bouveret) and "myesthenia gastrica" (Boas). Boas makes use of a classification of gastric motor disturbances that has met with favor by many: he speaks of mechanical insufficiency of the first and second degree, the first degree being so-called "atony," the second "gastrectasia."

By atony—to adopt the popular term—we mean a condition of diminished motile power of the stomach, resulting in an inability on the part of this organ of ridding itself of its contents in a normal period of time. We may further speak of primary and secondary forms of atony, and this brings us to a consideration of the conditions under which it exists, and its causes.

Boas has observed primary gastric myesthenia occurring as a congenital or hereditary defect, and even finds it running in families, though Ewald doubts the frequency of primary atony, that is—a muscle hypotonicity pure and simple, and sees in this condition a strong neurotic element, leaning to its classi-

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fication among the neuroses. Among the forces at play in bringing about an atony secondarily, we may state that general diseases, fevers, anemias, etc., that leave the system in an asthenic condition, often exert a similar influence upon the stomach-walls, reducing their tone likewise. Excessive eating and drinking—by the constant strain put upon the stomach-walls—may cause a dilatation and atony, though—as Pepper and Stengel (*American Journal of Medical Science*, January, '97) point out—dyspeptic symptoms are present also, and it is quite possible that the primary cause of atonic dilatation is some other gastric glandular disturbance. Atony may associate itself with any, and does associate itself with many forms of gastric disturbances, and thus it becomes a difficult matter to say which of these was the primary condition, and we find ourselves dealing with a vicious circle of circumstances: a primary gastric myesthenia soon has added to it disturbances of the gastric glandular functions, and *vice versa*, many pathological gastric conditions give rise to the complication, atony.

Indiscretions in diet, and, as already said, excessive eating, more particularly the inordinate use of liquids, such as alcohol, coffee, tea, soup, and the long-continued use of cathartic waters, etc., are the more common direct causes of this form of gastric trouble. There are also other and graver causes, such as internal and external obstructions to the expulsion of the stomach-contents, or gastric ulcer and carcinoma leading to secondary muscular changes, and these conditions frequently pass on to mechanical insufficiency of the second degree (Boas)—gastrectasia.

Symptoms.—Among the more prominent subjective symptoms, we may briefly mention the following: a feeling of decided fullness after eating, and satiety before the full meal is taken, gastric distress of variable duration, eructations, dizziness, and constipation. The ingestion of fluids is especially prone to cause a sensation of weight. Neurasthenia, with all its pronounced and peculiar manifestations, is a condition

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frequently complicating long-standing atony, and with it obstinate constipation and fermentation are also troublesome complications.

The objective symptoms are of a more distinctive character, and call for an examination of the stomach with reference to its size, its power of expulsion and tonicity, and in a minor degree, the chemistry of its secretions.

Though atonic stomachs are not always dilated, this is so generally the case as to almost make it a rule. On the other hand, a large stomach is not always atonic, for it may have normal power of expulsion, and this condition, not frequently met with, being known as megalogastria. (Ewald.)

Normally, the lower border of the stomach extends to a point about one and one-quarter to two and one-half inches above the umbilicus, and an organ whose large curvature is found at or below the umbilicus; may be considered to have abnormal dimensions, providing the condition be not one of a displaced organ—a gastroptosis.

The elicitation of the splashing sound("clapotement" of the French), and the percussion of the stomach, are among the important methods of physical examination. The splashing sound is elicited by a succession of quick shocks over the stomach-area with the tips of the fingers, and when present upon the taking of a small quantity of fluid, 100–200^{cc}, or several hours after a light meal, a myesthenic state may be inferred. An error may creep in if the contents of the colon are liquid; in such case the bowel should either be evacuated or a reëxamination made when the feces are of normal consistency.

Percussion, unless the stomach be artificially distended with fluid or gas, is, as a rule, quite unsatisfactory, though Pepper and Stengel (loc. cit.) seem to be well pleased with the results they obtained with auscultatory percussion. I have tried this method in a few cases, with fairly satisfactory results; it is surely far superior to the ordinary method of percussion.

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Artificial distension is most easily brought about by administering a Seidlitz powder, drinking the two portions individually, so that the evolution of gas takes place in the stomach, or better—and fraught with less danger—by pumping air into the stomach with an ordinary bulb-syringe through a previously passed tube. Electric illumination of the stomach, (gastro-diaphanoskopy) is also used, but has found few enthusiastic supporters. Dehio's method, that of having the patient drink two or three tumblerfuls of water while standing, and then determining the lower border by percussion, is quite satisfactory. The Röentgen ray gives promise of becoming a very useful adjunct to the methods of diagnosticating the position and contour, as well as abnormalities of the stomach and intestines. Boas and Levy-Dorn (*Deut. Med. Woch.*, No. 2, 1898,) use for this purpose large-sized celluloid-coated gelatin capsules filled with metallic bismuth. This capsule is swallowed, and since it permits but few rays to pass through, and hence throws a satisfactory shadow, can be followed in its passage from stomach to bowel until it leaves the system, and its position noted at various periods. The results thus far obtained have, according to the authors, been very encouraging.

Various tests of motor-function are made use of—the best being Leube's test-meal, consisting of a plate of soup, a piece of steak, a slice of bread and a glass of water. Seven hours after its ingestion this must normally have passed out of the stomach. If, upon examination with the stomach-tube, solid particles are found remaining, a motor weakness may be argued.

Ewald's salol test has been found sadly deficient by many observers, but instead of examining the urine to record the time that elapses before the salol begins to be excreted, Huber has suggested a modification, testing for the length of time during which excretion takes place. He claimed that a normal condition existed if the urine reaction (purplish precipitate upon the addition of ferric chloride solution) disappeared

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after twenty-seven hours, and that a delay in the expulsion of the stomach's contents could be argued if the reaction continued many hours after. The reliability of this is adhered to by a few, but fought by many.

The chemical examination of the stomach-contents shows, in an uncomplicated case, nothing distinctive. The acidity may be subnormal, but more frequently there is a normal or hyperacid condition.

The diagnosis of gastric atony is not difficult if the various subjective, and, more especially, the objective signs as detailed, are elicited. In the differential diagnosis, gastrectasia and gastroptosis must be considered. As symptoms of gastrectasia we may mention: excessive dilatation, habitual vomiting of enormous quantities,—frequently containing remains of a previous day's meal, and this in a state of much fermentation—hyperacidity, and usually sarcinae and yeast fungi; morning lavage reveals remains of the previous evening's meal, a condition never found in atony; the general health of a gastrectatic patient is very bad, and emaciation is often quite extreme.

Gastroptosis—a sinking of the whole stomach—is usually associated with a certain degree of enteroptosis. It may be briefly described by the citation of following case: Mrs. K., aged 50, has had symptoms of gastric distress for many years, including frequent attacks of severe pain after meals, and marked constipation. Examination reveals the following: considerable emaciation, distension in umbilical region and relative flattening in epigastrium, succussion-splash demonstrable at some distance, splashing sound elicited over a vertical area of six inches— two above and four below umbilicus—covering the visible distension and making it possible to definitely outline the large and small curvatures without artificial distension. In addition there were evidences of the retention of food in the stomach for longer than normal periods. In this case we

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must diagnosticate dilatation in addition to dislocation of the organ.

In place of detailing the treatment prescribed for the average case, I shall dwell on two illustrative cases of atony, one of very mild character, the other of very severe type, and the treatment of these cases may be taken as that quite generally applicable to all cases.

CASE I.—E. K., age 22, office clerk, leads a very sedentary life. Complaint of gastric distress is of three months standing. Acidity and fullness are experienced after eating, and there is considerable gaseous distension and constipation. There is no vomiting. Four hours after eating a light meal splashing could be elicited in epigastrium, its lower limit being 5^{cm} above umbilicus.

Auscultatory percussion of stomach covered this area quite accurately. Patient refused to have stomach-tube passed, so no direct examination of gastric contents could be made. However, from the data given, I felt justified in making the diagnosis: atony of mild degree, without dilatation. The patient was advised to take as much exercise as possible. In addition he was given a cascara laxative and told to make frequent flexion-movements of the thigh on the abdomen, while lying in bed—these movements acting as a massage, strengthening the abdominal muscles. For direct tonic and stimulant action, nux vomica was given in pill form, combined with soda bicarb. Four weeks later patient reported himself well, and physical examination elicited nothing abnormal.

This, it is true, is a mild case, but the tendency of the disease is to progress, and the earlier the proper treatment is instituted, the more satisfactory are the results, for both physician and patient.

I wish now to detail another case of atony, but one of very different character, since it shows us the disease in a very

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advanced stage, bordering on gastrectasia, and illustrates the symptoms, diagnostic points and treatment in an instructive and satisfactory manner.

CASE 2.—Patient, male, age 28, bookkeeper by occupation, has been complaining of gastric discomfort for about ten years. His habits have been fair, alcohol and tobacco are used moderately; when careful with diet feels more comfortable, but frequently indulges in heavy and rich meals. Complaint now is of gastric uneasiness and a feeling of weight and fullness of several hours' duration, after eating. Does not vomit. Fluids especially occasion distress. Several times, after midnight suppers, he has had to remove contents of stomach on the following morning by means of the stomach-tube, such was the uneasiness felt. He has come to me on several occasions, an hour or two after eating, to have his stomach washed out and relieved of its distress-giving contents.

Ordinarly no residue of the evening meal is ever found in the stomach on the following day, and this fact was thoroughly tested. Gas eructations are frequent; appetite good; there is but little epigastric pain or sensitiveness to pressure. During the past few years he has had various neurasthenic symptoms: giddiness, drowsiness, lack of energy and concentration of thought. The bowels are markedly sluggish, in fact there has not been an unaided movement for several years. Occasionally great abdominal distension occurs several hours after eating, and this accumulation of gas causes great discomfort.

Examination reveals the presence of the splashing phenomenon four hours after a very light luuch, and after two tumblerfuls of water are taken it can be easily elicited as low as the umbilicus. I did not artificially distend the stomach but light percussion seemed to bring its lower border about one inch below the umbilicus. Upon the results of the salol test alone I should not base positive conclusions, but with other

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symptoms pointing to a dilatation and motor-insufficiency, I think it significant that the excretion of the salol in the urine began long after what has been considered the normal period, and continued—instead of about twenty-seven hours—over forty hours after its ingestion. The stomach-contents when removed one hour after a Boas test-breakfast, consisting of a roll and a large glass of water, showed but little undigested matter, slight fermentation; the total acidity varied at different times between 0.10% and 0.27% (normal 0.15–0.20); free HCL. was always present, lactic acid absent. Unfortunately a Leube test-meal was not taken at this time, but I considered the other signs sufficient to warrant the diagnosis of gastric atony, without passing the tube for another examination. Abdominal massage, galvanization, and faradization both intra- and extra-gastrically, properly regulated diet, strychnin with soda, salol, laxatives, etc., constituted the general treatment. Four months later the Leube test-meal was given and the stomach was found to have completely emptied itself in the normal period of time—seven hours. Moreover, the splashing phenomenon was practically absent; the lower border of the stomach descended but little beyond the normal, and the salol test, taken for what it is worth, exhibited a positive reaction at what is considered the normal period—sixty minutes after its ingestion, and disappeared altogether after a lapse of twenty-seven hours. The intestinal atony that also exists, still gives considerable annoyance.

As to the treatment of gastric atony, the following general directions may be given: All discoverable causes, such as anemia, condition of exhaustion, etc., should be attended to, and rectified as far as possible; the excessive use of alcohol and other liquids must be stopped; the diet must be properly regulated: it should consist of easily digested foods, and better than three full-sized meals per day, are five meals, each of smaller quantity, and taken at shorter intervals. The gastric contents should be tested occasionally: if the acidity

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is above normal, meat diet is more easily digested; if subnormal, a lighter diet, consisting of light meats, vegetables, etc., is indicated; liquids are to be used in small quantities; fresh fruits frequently set up fermentation, stewed fruits on the other hand, being usually well borne. A general tonic treatment is to be highly recommended: deep massage of the abdominal walls, calisthenics, hydrotherapy, electricity, both faradic and galvanic, and applied externally as well as intraventrically; of various drugs that may be used, strychnin is the best, and with it may be combined a laxative, soda bicarb if necessary, salol or salicylic acid, if there is much fermentation, etc. The constipation must be combatted with suitable diet and an occasional laxative. Drastics should be avoided. Systematic lavage of the stomach is uncalled for, since in atonic conditions no residual food is found in the stomach in the morning, and therefore, lavage accomplishes no purpose.

To summarize then, we record as subjective symptoms of gastric atony: Fullness, weight, and distress after eating, early satiety, eructations, nervous symptoms and constipation.

Objective signs: Atonic dilatation and deficient motor power.

Treatment: Dietetic, general and tonic.

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DELIRIUM TREMENS IN MODERATE CONSUMERS OF ALCOHOL; WITH REPORT OF FOUR CASES.

BY R. ELMERGREEN, M. D., OF MILWAUKEE.

In presenting my paper to you I shall deviate from the usual course, giving first, a brief clinical report of four cases of delirium tremens, all occuring in moderate consumers of alcoholic beverages, (mainly beer), and second, my generalized observations bearing on the peculiar type of delirium under discussion.

CASE 1. F. J., male, aged 32, blacksmith, married; family history as regards alcohol, negative. Habits fair, retired early, worked ten hours a day, and had a good appetite. During the last three months appetite became poor, tongue coated, and patient suffered some slight gastric distress in the morning. A few drops of nux vomica before meals, and essence of pepsin after meals, generally relieved him. Patient had been a moderate consumer of beer for fifteen years or more. He drank from two to three quarts daily, supplementing it with an ounce of whisky mornings and afternoons. His general appearance was normal. The face was neither pale nor bloated, and there were no indications of jaundice or incipient alcoholism. Early on July 30th he was kicked by a horse, fracturing the tibia. I reduced the fracture within two hours of the accident, and dressed it temporarily. The fracture was a simple one, with no marked displacement. Twenty-four hours after the accident he became restless, the following night he became slightly delirious. He now began to have hallucinations, picked at the bed-clothes, and talked incessantly. His temperature rose to 103½°F., pulse 110. On inspection I found the ends of the tibia in place, and the gen-

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eral appearance of the limb favorable. Forty-eight hours after the accident the typical severe delirium tremens set in. The tremor became more violent, the hallucination more severe and his struggles with imaginary foes, pitiable to witness. The thermometer in the axilla, kept there by main force, registered 105° F. Two hours later the temperature went up to 107½°F., and the patient expired in convulsions within half an hour. No *post-mortem.*

CASE 2. F. W., middle-aged man, coal driver, married, heavy-set, looking healthy, drank beer in moderately large quantities daily; took whisky occasionally. Came home feeling very tired on Saturday afternoon, complained of headache, and pains in back and limbs. Pulse 96, temperature 101°F. Some tenderness over abdomen, could not answer questions intelligently. I diagnosed typhoid fever, and instructed the family accordingly. The next morning his temperature went up to 104½°F., pulse 110. Patient had not slept the whole night but had picked at his bed-clothes, scolded, and struck at imaginary foes constantly. He answered all questions promptly, like a machine. The family now informed me that his sickness dates from Saturday morning, when he saw his comrade mangled in a machine at the coal works. His tongue was too tremulous to be protruded and a general tremor was developing. There was diarrhea and vomiting. He refused all nourishment. Within two hours after my morning call, I was hastily summoned again. I found the patient up, carefully dressed, and calmly talking about going to work. He had called for whisky, and not daring to refuse, his wife had allowed him more than I had advised. The patient was filling his pipe with trembling hands, and succeeded in lighting it, but could not keep it in his trembling mouth. He apparently was glad to see me, shook hands and expressed himself as feeling well now, and if I could only take the bugs and the cats with me, he would go to work. During this time he sat on a chair and every few seconds struck at his imagi-

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nary enemies. I induced him to undress and retire. His temperature now registered 105°F. Six hours later he became violent, with typical horrors, tremors, and his temperature went up to 107° F. After two hours he was seized by violent convulsions, and died with a temperature of 108½°F. No *post-mortem.* Death proof, chronic alcoholism—delirium tremens.

CASE 3. This case has no further history than that revealed by a lay-woman, supplemented by a hasty and careless clandestine *post-mortem.* T. B., aged 40, male, mechanic, unmarried. He drank beer and whisky daily for ten years, but was never known as a drunkard, the way we generally use the term. Came home complaining of his ankle, which was injured in falling, or rather slipping out of a dog-cart. That same evening he became slightly delirious, talked continually about his work, picked his bed-clothes, had some diarrhea and vomited freely. He rapidly grew worse before a physician was summoned. Two of his brothers could not keep him in bed. He struggled violently with imaginary foes, calling on his brother to take the cats and snakes away, trembled all over, became maniacal, and expired with convulsions, thirty-six hours after he received the injury. *Post-mortem:* Brain normal, but slightly hyperemic all over; membranes congested, but neither thickened nor diseased. A hasty look at the heart showed it to be normal; liver cirrhotic; stomach badly congested; kidneys, no record. Cause of death, delirium tremens. I need not apologize for this unique *post-mortem,* but assure you that, under the circumstances, we were very fortunate in seeing as much as we did.

CASE 4. On the 30th of January last, I was instructed by a mutual insurance company of Chicago to inquire into the mysterious death of one G. T. Through the courtesy of Dr. Earles, I learned that the patient had died at the Trinity Hospital, and that, to use the doctor's words, "cause of death was not clear." In answer to my letter of inquiry to the

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attending physician, Dr. Bodenstab, I received the following brief history, accompanied by his courteous regrets at his inability to give further details. G. T., a middle-aged, married man, shoemaker by trade, fell while stepping out of a saloon, and sustained a fracture of the wrist (Colles').

The doctor reduced the fracture promptly, and dressed it temporarily, leaving instructions with the patient to call at his office the next morning for readjustment, or the plaster dressing.

The next day the patient grew restless and slightly delirious. Upon the doctor's advice, he was now removed to the Trinity Hospital. He rapidly grew worse here, became violently delirious, and died less than seventy hours after he received the injury; now mark, with a temperature of 108° F., and severe convulsions. *Post-mortem*, negative save for some slight edema and hyperemia of the membranes. Death proof reads edema and hyperemia of the brain.

Upon inquiry I find that the deceased was not a drunkard, but drank whisky and beer in large quantities daily. As in the three preceding cases, he never had an attack of delirium tremens before.

The widow's claim for benefit is contested. Of course it will be difficult to convince a jury that this man died with delirium tremens.

It may be wise to remind you before I close, that all these four cases were precipitated by an accident, or severe nervous shock.

The first two cases were treated on the routine plan, with large doses of bromides, supplemented with morphia hypodermically and chloral per rectum and mouth. The second case received in addition, alcohol. The third case received no drugs further than the traditional teas a portion of our good lay-women are so singularly partial to. The fourth case was under the care of an able and conscientious physician, and received, perhaps, the best care of the lot. They all

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died, however. They were all daily moderate consumers of diluted alcohol, and died under similar circumstances, ending with an extraordinary high temperature and convulsions.

That the delirium tremens in all these cases was typical, no one will dispute.

The brief, but at the same time painfully correct reports of the four cases of delirium tremens, just read, all precipitated by either a minor accident or shock, and all occurring in moderate consumers of diluted alcohol, mainly in the form of beer, are either diagnosed wrongly, or stand as a distinct type of delirium tremens practically overlooked by our authoritative text-books on that subject.

I have consulted more than thirty writers on alcoholism, and its train of symptoms, and received little or no enlightenment.

In my consultation with physicians, I am sustained in my diagnoses, and, in fact, by the process of elimination, we can not logically arrive at any other conclusion.

Delirium tremens is both a disease and a symptom. It is a symptom incident to alcoholism, as we commonly meet it in every-day practice. As a symptom of chronic alcoholism, or when used synonymously with mania a potu as a symptom of acute alcoholism, pyrexia is generally absent, or, if present, the temperature rarely rises 2 or 3 degrees above the normal.

Under judicious treatment the patient generally recovers completely within one or two weeks.

As a disease *per se*—a disease of the brain and membranes not necessarily accompanied by any other pathological changes of the liver, stomach, kidneys, etc., alcohol would but stand as the etiological factor, and shock or accident as the immediate exciting cause.

This violent type of delirium tremens I have observed always occurs in daily moderate consumers of large quantities of diluted alcohol, in whatever form, for a long time. It

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never takes place in old drunkards as the result of over-saturation of the system, nor does this type, to my knowledge, ever manifest itself in the uninitiated as the result of a prolonged spree or a temporary excess. It differs from mania a potu in-so-far as the latter is never accompanied by the characteristic tremor and is always a type of temporary mental derangement, resulting invariably from a history of acute alcoholism. Again, in the former, the temperature is always high, and hallucination and delirium are bad, while in the latter there is generally no fever, and regular mania with delusions invariably characterize it. Besides, in mania a potu the maniacal delusions and paroxysms are brief in duration, the homicidal tendency always present, and recovery the rule.

So far as I have observed, the appreciable pathological changes in the brain and membranes are confined to passive congestion, or hyperemia of the membranes, and slight edema of the brain-substance. In neither of the two cases "posted" was there any indication of hemorrhagic extravasation in the cerebral substance.

In all of these cases there was absolutely nothing pointing to uremia nor traumatic meningitis, and we are certainly not justified in entertaining the possibility of idiopathic meningitis (if there is such a disease) independent of the etiological factor, alcohol, in any of these cases.

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THE PASSING OF THE FAMILY PHYSICIAN.

BY E. C. HELM, M. D., OF BELOIT.

It may be well to pause in our headlong pursuit of science and of knowledge, to see where we are now standing.

A condition and not a theory confronts us, and whether it pleases us or not, has nothing to do with the case.

An examination of the past and present status of the medical profession will reveal many changes.

Only one or two generations ago the physician and the minister were consulted in all family affairs; they were ever honored and welcome guests, and they were everywhere powers for good. Even the family circle was incomplete without them.

Whether the minister retains his old proud position or not, is foreign to the object of this paper, as it deals only with the family physician.

Ian McLaren's "Weelum MacLure" was not an ideal person, but was the prototype of the beloved family physician; who not only at birth and at death, but all through life, in sickness or in health, in poverty or in wealth, was the one upon whom all relied for sympathy and for help.

He was loved and honored to a degree now unknown, and his influence for good was great and far-reaching.

The family physician was consulted for all ailments, great and small. He knew his families, their modes of life, their peculiarities and idiosyncrasies, and the perils to which they were exposed.

His knowledge of the family was so thorough and complete that he almost intuitively realized the nature of the malady as soon as he learned who was sick.

This thorough and intimate acquaintance with his patient,

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with the family and personal history, the surroundings and occupation, was of vast service to the family physician.

All diseases and injuries came directly to him, and he cared for them faithfully and well.

The case was completely in his hands, and it was left for him to call in the specialist when required.

His wants were few, his fees were small, and were often honorariums, and he lived simply, loved and respected by all.

He was a gentleman of the old school, a scholar of no mean ability; well-posted not only in medicine and surgery, but in knowledge of the world and of nature, and most of all in his intimate knowledge of humanity.

In the Revolution, in framing our wonderful constitution; in the halls of Congress, he was even at the front, a leader of men.

Our freedom, our wise laws, and our liberal government were in part due to his energy, his wisdom, and his patriotism.

The lawyers and the politicians did their part, but did not do it all, as they are at present so willing to do.

He was not so absorbed in money-getting, that he had no time to devote to forming a wise and enlightened public opinion.

He had a powerful hold upon all classes and conditions of men, and for him all had a cordial welcome, and sincere love and admiration.

He was wonderfully fertile in resources, able and ready to meet all emergencies; yet most of all he was the loved and faithful friend, counsellor, companion, and leader of the people.

Unselfish to a rare degree, his tomb might well bear this motto, "There lies one who loved his fellowmen."

Too often he wore himself out in his labors of love, and the ironical jeers of the Jews to our Saviour on the cross could well be applied to the faithful old family physician, who so

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bravely followed in that Saviour's footsteps. "He saved others; himself he could not save."

A noble heritage is ours, and only by expending our entire lives for humanity can we hope to become worthy sons of such fathers.

How different the present condition of affairs!

The physician wants to be a specialist from the start. It will not do to wait for years of general practice, on whose broad substructure he can build, but the colleges and post-graduate schools turn out specialists *pro re nata.*

He must be in style regarding clothes, office, residence, turnouts, etc., and must have his stenographer, his business-manager or bill-collector, and must press for monthly settlement of his dues.

The senior Dr. Wm. Pepper, I think it was, never presented a bill or set a price upon his services, the honorariums were left to the generosity or gratitude of his patients. Such a course would now bankrupt us all, owing in part to the change in the public, and in part to the change from the family physican to the up-to-date specialist.

If the latter's patients are unable to pay his necessarily high charges, he will care for them free of expense at the clinics or the hospitals, but not elsewhere. This tends to pauperize the poor or drive them to perhaps less skillful hands.

The ever-growing habit of specialism leads the patients to diagnose their own case, and thus save a fee, or at least inclines them to go to a throat-specialist for tonsilitis, to a nose-specialist for coryza, to an oculist for conjunctivitis, to a neurologist for headaches, to an electrical expert for neuralgias, to a genito-urinary man for "pain in the kidneys," to an advertising quack for all chronic ailments, (though even these advertisers are of late becoming specialists,) and to a gynecologist for leucorrhea.

Heretofore this multi-specialism has affected the family physician mainly, and surgical troubles usually went to the

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surgeon; but now the general surgeon is feeling the same evil which has so sorely tried the family physician.

One patient leaves the surgeon to go to the genito-urinary surgeon, another to go to the gynecological surgeon, and all the specialities now have their surgical experts, so the general surgeon bids fair to follow the general physician into "innocuous desuetude."

Has this change been for the good of the patient, and for the relief of suffering humanity? Has the public at large been a substantial gainer?

Has not the rush and hurry after wealth, fame, and position changed our beloved profession into a business, a legitimate and praiseworthy business, if you will, but none the less a business? If so, where will it end?

It takes no prophet to foresee that if the present conditions increase, family physicians will become as extinct as the ichthyosaurus, and ere long suffering humanity will be treated by a syndicate of physicians.

These various specialists, with their business manager, will have contiguous offices, and any one finding a case not in his line will promptly turn it over to the proper specialist. The manager will look after such details as the financial responsibility of the patient and the collection of the fees.

In this syndicate will needs be one emergency man or diagnostician, who will take care of emergencies temporarily and will see that the patients go to the proper specialist.

It may happen that a case will be treated the same day by an oculist, the aurist, the throat-specialist, the lung, the uterine, the rectal, and the electrical specialists, all of whom will do perhaps better work than could the family physician, but in such a case the syndicate fees would be appalling.

Each member of the syndicate would treat the local conditions or organ belonging to his specialty, but his limited field of observation and treatment would not entitle him to be heard on the treatment of the body in general.

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There has been a great increase in knowledge, and no brain can hold all that is known about the human system in health and in disease, and a certain amount of specialism is just and necessary.

It is nevertheless a fact that this great increase in the army of specialists, many of them just out of college, is apt to create one-sided men, men who are prone to magnify the importance of the organs of their specialty, and overlook other organs which may be equally at fault.

We have all heard of the entomologist who devoted his life to the study of a certain beetle, and when dying he bemoaned the fact that he had taken such a large field of study. He said that if he had devoted his life to the study of the hind leg of that beetle he would then have mastered that subject, but he had taken such a broad field (thereby dissipating his powers) that he had accomplished comparatively little.

In these days of wonderful progress in medical and surgical education, all physicians must stand upon the same basis of knowledge at the time of graduation, and all must be fairly competent to practice medicine in all its branches.

The old idea that a first-class, general education, followed by equally good college training, was necessary to fit one for general practice is still the rule and is more vigorously enforced than ever before.

But that other rule, that it requires many years of general practice, with its careful study of the body in all its parts, both in health and disease, to enable one to become a successful specialist is now obsolete.

This second rule was a safeguard, and kept in general practice all except the few who in after years showed an especial proficiency in certain branches, into which they drifted often, almost without their knowledge or consent.

Now the specialists' axiom is that physicians are mainly of use as diagnosticians and their only function is to diagnose each case and send it to the proper specialist for treatment.

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If this rule is just and becomes the usual method of procedure, how long will such a physician be a reliable diagnostician if he does not follow out the history and treatment of his cases through all their various phases?

The specialist cannot know the idiosyncrasies, habits, or surroundings of his patients, and thus important points in successful treatment are lost.

The so-called family physician, being only the diagnostician, will be incapable of furnishing the necessary data.

Formerly the title "Doctor of Medicine" was one of great dignity and value and its legitimate possessor had reason to be proud of it.

Now to be simply a doctor and not a specialist is to be considered of little value to the community.

So true is this that family physicians, even in our smallest hamlets, often feel obliged to adopt some specialty.

This is not an over-drawn or fanciful sketch, and if the wise and otherwise (if such there be) members of this Society will fully discuss this grave question, the purpose of this paper will be accomplished.

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GASTROSUCCORRHEA CONTINUA PERIODICA.

BY F. N. SAUER, M. D., OF RACINE.

Gastrosuccorrhea continua periodica is a condition characterized by a constant secretion of gastric juice, giving rise to attacks of vomiting and severe pain. Organic affections of the peripheral, or central nervous system, are present in some cases of this disorder, although it may occur in persons who are apparently free from nervous trouble. Reichman was the first to call attention to the periodic continuous flow of the gastric juice. A few years previously Rossbach has described, under the name of gastroxynsis, a nervous affection of the stomach which consists of a sudden appearance of severe headache, accompanied by gastric pains, and vomiting of very acid chyme or gastric juice.

In accordance with different authors, we agree that gastroxynsis and gastrosuccorrhea continua periodica are one and the same affection and do not differ essentially. The symptomatology of the disease is most peculiar, as in the midst of perfect health, a sensation of discomfort is experienced in the gastric region, which is associated with restlessness. Soon afterward the discomfort changes into a rather painful sensation and nausea appears. The patient is compelled to occupy a recumbent position. The symptoms just described continue, or rather increase in severity, and in about an hour or two the nausea ends in vomiting of a large quantity of gastric contents. The patient may now feel a little relieved for a short time, but soon the same symptoms return. The appetite is entirely lost, and, instead, there is extreme thirst. The more the patient drinks the more, as a rule, he has to vomit. If he abstains from drinking, the vomiting is less frequent, but persists nevertheless. Thus, as a rule, the pa-

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tient has to vomit a large quantity of a watery liquid, which is very acid in character, and either quite clear or greenish from the admixture of bile. If this liquid be examined, it will be found that free HCL. is present in large quantities, as are the ferments (rennet and pepsin). No food-particles can be discovered in the fluid. It consists of either clear gastric juice, or gastric juice with admixture of a little bile.

After such an attack, frequently a constant desire to vomit persists, and the patient suffers very violent, painful, retching; often a quarter of an hour after the last paroxysm, the patient's efforts to vomit cause a small quantity of clear yellow bile to be rejected, even if the patient absolutely abstains from all kinds of food and drink. A few hours later, a large quantity of gastric juice may again be vomited. The patient in this condition is hardly able to sleep for any length of time, as the pain awakens him soon after he has fallen asleep. The abdomen, as a rule, is sunken; the patient looks extremely pale and his extremities are frequently cold.

Severe headaches often accompany this train of symptoms, and constipation is almost a constant concomitant. After this condition has lasted three or four days, or sometimes even longer, the nauseous feeling begins to disappear; the pains subside, and the patient experiences for the first time, a desire for food. He is now able to eat without vomiting and, in a day or two, feels like himself again. It is characteristic of this affection that the symptoms disappear almost suddenly, and that the patient who seemed to be in a wretched state a few hours before, now appears nearly well. After a period of perfect eupepsia, varying from several weeks to a few months or a year, or even longer, a similar attack may occur. The attacks may then either recur after the same period of time, or the intermissions of health may become gradually shorter, so that ultimately the patient has hardly recuperated from his last attack before a new one supervenes. The latter condition forms the intermediary stage between periodic and chronic

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gastrosuccorrhea. During the free intervals, the gastric secretion takes place either in a perfectly normal manner or hyperchlorhydria may exist in either case; however, the stomach remains free from secretion in its empty state.

The diagnosis of gastrosuccorrhea continua periodica can be made by the above-described symptoms. In connection with the examination of the vomited matter, which is found to consist principally of clear gastric juice, without admixture of much food, or with the examination of the stomach in the fasting condition, by means of the tube, which results in the withdrawal of considerable quantity of clear gastric juice, inasmuch as similar attacks of gastrosuccorrhea may occur as a consequence of either an open ulcer or a cicatrix within the stomach, the pylorus, or the duodenum, it will be necessary to exclude such organic affections for making a diagnosis of continuous periodic flow, which we consider to be a nervous affection.

It will also be of importance to exclude organic, spinal, or cerebral troubles, which may cause a similar disorder of reflex origin.

The prognosis of pure gastrosuccorrhea continua periodica is, as a rule, not bad. In many instances it is possible either to make the attacks less severe, or in some instances to effect a cure by rational treatment. It will always be advisable to analyze the gastric juice of the patient during the intervals. If hyperchlorhydria is found, this will have to be treated, even if there should be no subjective complaints, for hyperchlorhydria is frequently, although not always, the cause of such attacks. At any rate, a hygienic way of living should be inaugurated by the physician. We are in the habit of prescribing a good-sized dose of bromide as soon as the patient feels an attack coming on, and find that occasionally it may be cut short at the very beginning. In some instances the attack, although not interrupted in its progress, is thereby rendered less severe. When the attack has appeared, the

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patient must be kept in bed; hot water-bags are placed over the gastric region, and if the pains are severe, an opiate, either alone or in combination with belladonna, is administered. During the first day of the attack no nourishment whatever should be given. A teaspoonful of cold water or a small ice-pill can be administered from time to time, especially if the patient is very thirsty. The next day small quantities of milk, matzoon or egg-water, one or two tablespoonfuls, are given every hour. On the third day the quantity of nourishment may be increased to half a cupful at a time, administered every two hours, and besides the above liquid food, the white of a hard-boiled egg chopped up fine, may also be given (one or two eggs a day). On the fourth day meat (scraped, raw, or broiled) may be tried, and afterwards the diet gradually arranged as for cases of hyperchlorhydria.

The system of diet as laid down here for every day from the beginning of the attack will certainly depend upon the condition of the patient, and will have to be modified accordingly. As there is always constipation during the attack, it will be best to move the bowels on the second and third day, either by glycerin suppositories or by a large injection of warm water (a quart of water and a tablespoonful of salts, or injection of sweet oil, one pint).

Gastrosuccorrhea Continua Chronica.—Continuous flow of gastric juice. Reichman, in 1882, described under the above name a disorder which is characterized by a constant secretion of gastric juice even in the absence of food in the stomach. Considerable quantities of gastric juice can be withdrawn from the stomach in the morning even in the fasting condition. In describing this new disease Reichman mentioned that he had observed sixteen cases. An exact scientific diagnosis had been made only in six of them; in the remaining cases, said Reichman, "I was able to find in the stomach in the morning in fasting condition a large quantity of a liquid containing HCL., and exhibiting digestive properties, but

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also containing much peptone and remnants of amylaceous food." Among these six cases which Reichman considers as typical of gastrosuccorrhea chronica, authors do not agree as to all six, and only consider case three worthy of the name; for the remaining five cases, aside from the constant secretion of gastric juice, presented other important lesions of the stomach, which in all probability were rather the cause than the effect of the constant gastric flow. In all cases described by Reichman, except case three, the stomach in the fasting condition contained a considerable quantity of liquid, consisting of gastric juice and containing only amylaceous food-remnants. When the stomach had been washed out previously, and the patient had abstained from food or drink, the stomach in the morning nevertheless contained clear gastric juice. These cases are then, undoubtedly, cases of dilatation of the stomach, or more correctly speaking, of stenosis of the pylorus in which hypersecretion must be considered as a concomitant factor. Many authors have laid too little stress upon the distinction between the constant flow of gastric juice and dilatation of the stomach due to stenosis of the pylorus. On this account the picture given by some authors of the true gastrosuccorrhea chronica bears a closer resemblance in many points to that of dilatation of the stomach than the picture of the affection in question. Inasmuch as the treatment of cases of stenosis of the pylorus is in most essential points different from cases of gastrosuccorrhea, we need only to know that the most rational treatment for stenosis is surgical. It is absolutely necessary strictly to differentiate between these two conditions. Some authors express doubts as to the existence of this new disease, and regard all cases published as simple dilatation of the stomach with stagnation of food. Whether the view held by some that the stomach secretes gastric juice in an empty state, is correct or not, is a question that is quite difficult to decide. But leaving aside the question about the physiology of the stomach, there is no doubt

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that, as a rule, the stomach in fasting condition does not contain any considerable quantity of gastric juice. Whenever larger quantities are formed, the stomach must be regarded as affected.

Etiology.—Gastrosuccorrhea chronica is met with much more frequently in men than women. In some instances there is present, besides this affection, some other functional neurotic disturbance. In some patients it is very marked. Thus some complain of a burning sensation all over the limbs, which lasts for three to four months, then suddenly disappears.

Like hyperchlorhydria, gastrosuccorrhea seems to arise from great mental worry or strain.

Symptomatology.—After a more or less prolonged period of different dyspeptic disturbances which are similar in character to those caused by hyperchlorhydria, there appears a pronounced sensation of pain several hours after, and shortly before, meals. Very soon vomiting supervenes as a new symptom. At first it occurs only occasionally, but constantly grows more frequent until at last there may be one or several vomiting spells a day. The vomiting appears most frequently after breakfast, sometimes also after supper. In a few cases it appears at night, preceded by a long severe attack of pain. The vomited matter is always very acrid and more or less liquid. The vomit consists, as a rule, of clear liquid containing hardly any food. The appetite is generally increased, although there are exceptions to this rule. In some cases the two extremes, hunger and anorexia, are very prominent. In most cases the sensation of thirst is greatly increased; constipation is very marked; there is some loss of weight, but not a very great degree of emaciation.

Diagnosis.—The symptoms might suggest the disease, but the exact diagnosis can only be made by a repeated examination of the stomach in fasting condition. The gastric juice or liquid contains no food-particles, but exhibits all the proper-

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ties of gastric juice. It may look greenish from the admixture of bile, but this is not an important sign. The filtrate, as a rule, shows a somewhat increased degree of acidity. It never contains any starchy products. Absence of erythrodextrin, achroödextrin and sugar microscopically; no sarcina or other signs of decompositions are found. Frequently cell-nuclei are met with in large numbers. In examining the contents one hour after Ewald test-breakfast, the gastric contents will be found to contain more liquid than usually, and the degree of acidity will be quite high (80–120°). As a rule the degree of acidity of the gastric contents is higher than that of the gastric juice when withdrawn from the stomach in a fasting condition. In examining the filtrate with reference to the starchy products, it will be found that the lugol solution will produce a deep violet or even blue color, showing that the starch has not been much changed. A thin disc of hard-boiled egg will be digested in the filtrate at blood temperature, half hour to an hour. There is a difference as to the degree of digestion of the albuminates and starches. The former are more quickly, the latter much more slowly digested, as can be determined after Riegel's test-dinner. Three to four hours after such a dinner the obtained gastric contents show hardly any meat particles whatever, (all being digested), whereas particles of starchy food form the principal part of the mixture. In this way the difference between the digestion of meats and starchy foods existing in this affection is seen at once.

In the making of the differential diagnosis of gastrosuccorrhea, organic lesions of the stomach, (ulcers and stenosis of pylorus), which are liable to be accompanied with gastrosuccorrhea, will have to be excluded. According to observations it is easy to exclude stenosis of the pylorus, but not an ulcer. In stenosis of the pylorus, the stomach, in the fasting condition, is also found to contain a liquid, but this is mixed with food, and the filtrate always shows the presence of starch or sugar

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products. But the main thing is that food-particles can be seen by the naked eye, whereas the liquid formed in the stomach in genuine gastrosuccorrhea does not contain any food-particles as described above. The presence of an ulcer will be suspected if there has been a preceding hematemesis or melena, or a circumscribed spot in the gastric region very painful to the slightest pressure. The absence of these symptoms will tend to justify the diagnosis of gastrosuccorrhea.

The prognosis is as a rule not bad. Most patients improve under rational treatment. Frequently, however, there are relapses. Some very obstinate cases are occasionally met with, and the trouble, although yielding somewhat to treatment, may persist for years. There is, however, no danger of a fatal issue resulting from this disease alone.

Treatment.—As we have seen, gastrosuccorrhea is always associated with hyperchlorhydria. The treatment of the latter condition with reference to diet, drugs, and mode of living, will have to be resorted to here also; especially should patients not partake of large quantities of liquid. In this affection more stress must be laid upon this point than in hyperchlorhydria. The medicinal treatment must be directed towards decreasing the undue amount of gastric secretion. With that end in view, atropia and morphin are recommended, three times a day. Subcutaneous injection is, however, of doubtful efficiency in chronic cases, whereas, as in the initial state it is effective. On the whole, injections should not be used at all, if there is any possible chance of avoiding it, as we usually run the risk of inducing the morphin habit in our patient. Large doses of bis. subnit. in water three times daily before meals, or the sulphates of soda or potash, or the carb. and bicarb. of soda, in warm water, some taken in fasting condition, some before dinner and some before supper, have good results. Lavage has given good results retained five minutes, then withdrawn by siphonage. The spraying of the stomach after lavage with ½–

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1,000 solution arg. nit. has given very great benefit. In cases of a very obstinate character, direct galvanization has been the most satisfactory treatment as yet known for this troublesome affection. We can, from personal observation, recommend it to any practitioner, and know, if rightly used, it will never fail to help his patient.

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THE RELATION OF SO-CALLED NERVOUS DISEASES TO MENTAL ALIENATION.

BY W. B. LYMAN, M. D., OF MENDOTA.

After three years of constant observation of the insane, under close supervision, and an examination of probably 1,600 cases, I ask myself the question, "Is there a more intimate relation or association of so-called nervous diseases amongst them than of other parts or organs of the body? Does the mere fact that the brain, the organ of the mind, resting in a large, bony cavity continuous with the spinal column containing the spinal cord, not possibly in some way give color to the prevailing impression that mental and nervous diseases are allied? Or, is it possibly the fact that gray and white matter—cells and fibers—form the component parts of both structures?" Observation certainly teaches that the gross changes causative of many nervous diseases certainly do not exist more frequently amongst the insane than the sane, and a case of insanity, caused by gross pathological change, cannot but be called merely a symptom of the condition. Of the vast number of insane, indeed, the strenuous efforts of pathologists have been unable, in the slightest degree, to unravel the cause, and in only those cases of progressive insanity have they found an atrophy of some of the cells or fibers, the only tissue change, except possibly, evidences of chronic active or passive congestion of the membranes. All modern thought tends towards the material and, in common with it, we must presumably seek within the brain the cause for mental aberration. Yet what evidence is there that the passions, the temperament, the emotions—any of which gone awry constitute insanity and form the basis of the most insane thought —are inherent in the brain structure alone or in part? Is the

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gloomy foreboding, the anxious fear, the self-incrimination of the melancholiac, existing because of his feelings holding full sway over his every thought and act, due to a brain condition? Or, are they inherent in structure other than brain-fiber?

We all acknowledge the gloomy pervading of an inactive or diseased liver, or of a diseased and incompetent heart—a condition differing from pronounced melancholia only in degree. Why, then, should we, when this feeling reaches the intensity to govern—irrationally—thought, seek at once its cause in the mental structure? May not this sense of good or ill-feeling, named mania or melancholia, regardless of its intensity, arise from chemical processes elsewhere than in cerebral structure? He who is depressed can think only thoughts in harmony with his feeling. So with him who is elated. It is impossible for them to do otherwise, strive as they may. How vainly many of us have many times striven to change the tone and tenor of the silent, pervading thoughts to no purpose!

However this may be, it cannot be gainsaid that the insane are no more liable to disease of the lower nerve-structure than the sane, and they present no more cases. History often shows eccentricity in manner or disposition from childhood, but cases of chorea and infantile paralysis are no more frequent. That there is close alliance between epilepsy and mental disease cannot be gainsaid. If for the moment we lay aside those cases of insanity which arise with perverted feeling as a basis, and take under consideration the etiology of those that present irrational thought, controlled by inherent instability of structure possibly—or, if not instability, possibly excessive development of structure giving the prevailing character to the actions and thoughts—we find little that we can consistently associate with the diseases of the lower nerve-centers.

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By the lower nerve-centers, I refer to those belonging to mankind as an animal, and are called into use in following the animal instincts largely. The warp and woof of individual mental structure, resulting, as it does, from transmitted development due to racial and family environments, modified only measurably by the immediate environment of the individual himself, or herself, is the result of ages, while the nerve-centers have, during all this time, attained no higher development. It seems illogical to me that because one is mentally alienated through an over-developed bump of conceit, or of avarice, or erratic propensities, that he is therefore more liable to disease of the so-called nervous system. In fact, such people usually live a long life without any apparent physical ailment, being the victims only of incoördinate thought, not of incoördinate movements. Functional diseases so-called —in fact, nearly all—partake of mental characteristics, this being the explanation why the various faith-cures are credited with so much in remedying them. But gross pathological change, as is evidenced to exist in physical disease, involving the cord and its appendages, is not demonstrated to exist in the brain as a cause of insanity. True, indeed, it is, that when it does exist mental symptoms appear, but these cannot be properly insane any more than the typhoid case or acute anemia with delirium.

With the great amount of original research and the modern skill and instruments of precision in prosecuting this work, I think it fully demonstrated that further search for manifest pathological change in the insane as causative of the mental symptoms, is useless. We must realize the higher structural composition that is yet beyond the ken of man—a structure built on a different plan—a structure moulded by thought, not moulded for thought, the basic structure existing in all alike, but the quality, the molecular arrangement, being individual, handed down to us through posterity; adding our little might n turn, we pass it on for better or worse, handing down to

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our offspring and visiting on them the good as well as evil of our individual effort and environment. Thus age after age, generation after generation, we go on building up and tearing down, arranging and rearranging mental structure, independent of the lower nerve-centers that simply aid us or are the connecting lines between thought and action.

Evident it is, then, that the loosely knit mental structure need manifest no pathological textural change to account for ill-balanced and perverted thought and action due to asymmetries in the building of the multitudes of thought-centers and thought-tracts; for truly no two minds can see things alike and, while the result of cerebration is often to arrive at similar conclusions, it is usually after very different individual impressions and comparisons.

This, to my mind, is the true pathology of mental disease; not gross structural change, but ill-structural building, beginning possibly generations ago, or possibly environment for which the individual is not properly constituted. If this were granted, it must readily be granted that the lower nerve-tracts and centers and their diseases are very little dependent on or related to true mental disease.

DISCUSSION.

Dr. White: I am greatly interested in the doctor's paper, and particularly the allusion he made to chemical changes affecting the mind. That has opened up quite a wide field for investigation among people in this specialty, and it is being pursued actively every day. I refer to the subject of autoinfection or autointoxication. I am glad the doctor alluded to it, and I would like to hear from some of the other gentlemen in the section with reference to that point. As to the occurrence of nervous diseases among the insane, my observation and experience would lead me to corroborate fully the doctor's findings and conclusions in that matter. I have

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not found nervous disease any more prevalent, if as much so, among the insane as among the same number of sane people.

Dr. Friend: Dr. Lyman spoke of the refined processes or methods which are now being used to determine changes in ganglion-cells. It is found by experiments and the use of Nessl's stain that certain changes occur in the ganglion-cell structure. The structural changes are most minute. In insanity, as Dr. White mentions, there are certain changes in ganglion-cells which are produced by poisons generated within the system. The nature of the poisons has so far not been demonstrated. The experiments that have been made by the action of poisonous drugs upon ganglion-cells, indicate by the use of Nessl's stain, that the poisonous drugs produce distinct changes in the ganglion-cell. The methods for determining changes in ganglion-cells are so refined and their processes are so slow that it will undoubtedly take years before we can have final data of these changes in insanity.

Dr. Fuchs: I think that Dr. Lyman's idea is this—and that we are getting beyond his idea,—that is, that it is largely a matter of training, and not a pathological change or chemical change. That the way we train ourselves to think will largely make us what we are, or what we will be, either sane or insane, and make our children probably the same kind of thinkers. Now, to that, I, at least, for my part subscribe. That is, there are mental faults irrespective of any chemical or pathological change. As regards degeneracy, or this and that being evidence of degeneracy, we have not yet been shown what degeneracy is, or that there is anything in the nerve-structure that demonstrates degeneracy. It all largely depends upon the moral training and the manner or habit of thinking that a man gets into. I would remark that my objections to the term degeneracy, do not apply to the use made of it by the pathologist. I object decidedly against its flippant use,—now fashionable with us—a la Nordau, Lambroso, and the Italian *criminal anthropologist.*

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Dr. Becker: I would like to corroborate what Dr. Friend says. It seems to me we have no right to assume, because our methods are not fine enough to discover changes in the brain that accompany, or that we believe accompany, insanity, that therefore these changes do not exist. Indeed, it seems to me, that admitting the correctness of Dr. Lyman's assumption that they are rather structural and dependent upon growth changes, or those that come in the course of development, they are still subjects for physical inquiry. It seems to me that Dr. Lyman's attitude commits us too much, unless I misunderstand the paper, to the idea that insanity is not a disease of the brain, and possibly attacks the physical basis of mind.

Dr. White: I may not have made myself quite clear in my statement with reference to autointoxication as a cause of insanity. I referred to it more as an aggravating, than as a distinct cause.

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GENERAL PARALYSIS OF THE INSANE.

BY S. B. BUCKMASTER, M. D., OF HUDSON.

One of the penalties paid by suffering humanity, incident to modern civilization, is the increasing prevalence of nervous affections. The multiplicity of modern inventions, the higher rate of speed at which we live and the vastly greater demand of nervous energy required, expose us to nervous risks wholly unknown to our forefathers.

Among the most serious of the many afflictions now endangering the nervous system is general paresis, or dementia paralytica.

This frightful malady, claiming its victims in increasing thousands, was first differentiated by Delaye and Bayle in 1822, and Calmeil, with more exactness, in 1826, since which time hundreds of observers have had only too many opportunities for studying it, as it is among the most frequent of the nervous maladies with which we are brought in contact.

Let us consider briefly, in their logical sequence, the factors of this disease.

Etiology.—Heredity plays an important part. The member of a family of neurotic history is more likely to develop general paresis than one from a healthy family, if a sufficient exciting cause presents. This exciting cause may be mental overstrain from close application to business, worry, sorrow, disappointed hopes, defeated ambition, or any prolonged strain of the emotions. Intemperance is also a cause.

Besides the congenital, there may be acquired predisposition. Few authorities now question the important *role* that syphilis plays in the production of paresis. Rieger says that the syphilitic is sixteen times as liable as the healthy indi-

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vidual, and Hirt states that of 257 paralytics examined by him, 171 were syphilitic.

Males are attacked by paresis much more frequently than females, in the ratio of about seven to two, and accepting the dictum as true that syphilis is a frequent cause, it explains why so many men in life's prime succumb to this ailment, as so many more men than women acquire syphilis.

Symptoms.—These, as the term general paralysis of the insane indicates, are both psychical and somatic. They may appear simultaneously, but usually the mental symptoms are first to manifest themselves. The patient becomes unable to concentrate his mind; he is easily fatigued and becomes careless in habits and dress. He makes mistakes in spelling, and later, syllables and words are eliminated.

His disposition changes, he becomes moody, quick to anger, and his will-power weakens. He may become indecent in talk and actions.

Insomnia claims him for a victim, his speech takes on the characteristic "scanning" form, and all these symptoms increase in severity. He may now exhibit evidence of increased mental excitement. He becomes talkative, noisy, restless, and expresses many delusions, which are usually of the most exalted character, unreasonable and unsystematized. He may insist that he is the strongest man in the world, he is twelve feet high, the wealth of worlds is his, etc. Within a few months a patient gave me the following statement regarding himself:

"I am the strongest man in the world and have whipped both Fitzsimmons and Corbett. I am the son of God, and was created by Him 1,300 years ago. He made my bones of the best Chicago steel, and covered them with Armour's best meat. He drew my skin on green and covered it all over with long hair, as it was then fashionable to wear hair all over the body. I own all the wealth in this world, and own all

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the other worlds, and will make you a present of four of them."

Among the first of the physical symptoms is a defect in articulation due to labial paralysis. The tongue shows fibrillary twitchings; the action of the facial muscles becomes exaggerated, and deglutition becomes difficult. The voice becomes nasal and cracked. There is apt to be irregularity in the size of the pupils, and owing to progressing atrophy of the optic nerve, amaurosis or amblyopia may be present. The gait becomes ataxic as the disease progresses, showing involvement of the spinal cord as well as of the cerebrum. The fingers lose their power of delicate manipulation, tremor is persistently present, choreiform movements sometimes occur, and there are derangements of both general and special sensibility, both anesthesia and hyperesthesia manifesting themselves during the duration of the disease, the latter especially, as neuralgias or headaches.

The patellar reflex becomes abolished as the cord becomes more fully involved, and is an important diagnostic symptom.

Epileptiform seizures are of frequent occurrence, simulating both *petit* and *grand mal.*

Paresis has one notable feature frequently occurring, in which there is a subsidence of the symptoms which may become so marked as to simulate approaching recovery, and these remissions may even permit the patient to return to his occupation. They vary in duration, being generally short, but sometimes lasting for years and being practically recoveries. Morel reports a case in which the patient had for three years been following his trade; Delasiauve, one in which the patient was still at work eight years after an attack of paresis which lasted fifteen months. Billod, Lanier, and others have reported similar cases. They are, however, rare.

Nothing accurate as to duration can be ventured, as some cases die within a few months, while others may live six or eight years. The average duration is about three years.

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There is a gradual extinction of the psychic functions, and mental as well as physical prostration may occur, unless life is extinguished during one of the convulsive or apoplectic seizures, or by intercurrent disease. The patient is helpless, bedsores may form, and he requires constant care and attention. In other words, he simply vegetates, and the best attributes of humanity have forever departed.

To the last, if able to be understood, his delusions of grandeur may persist, and when almost ready for the grave he still insists upon his strength, wealth, and power.

Pathology.—The pathological anatomy is yet obscure. The macroscopical appearance shows atrophy of the cerebrum, especially of the anterior region, where the convolutions are reduced in size.

Tuczek says that there is atrophy of the fine medullated nerve-fibres, while Binswanger, Mendel, Gudden, and others report atrophy and sclerosis in the ganglionic cells.

Friedmann describes atrophic alterations in the white matter of the brain, and Westphal has shown that the pyramidal tracts of the posterior columns of the spinal cord as well as the cerebral central ganglia all present evidence of degeneration.

The pia mater is often so adherent over large areas as to cause decortication when stripped off, while in other cases it is thickened with fluid in the meshes.

Berkley's observations upon the interference with the normal supply of nutritive material from the blood, as a result of vascular degeneration, are of value, but the primary cause has yet to be discovered and demonstrated.

Diagnosis.—The most experienced diagnostician is liable to err, but as a rule general paresis presents so many typical symptoms that it is unmistakable. When a man in the prime of life shows change of character, mental deterioration, loss of memory, delusions of grandeur, exaltation, or depression, perhaps epileptiform or maniacal outbreaks, physical break-

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ing-down, as evinced by irregularity of pupils, speech disorders, loss of proper coördination of movements of hands and feet, change of chirography with elision of symbols, syllables and words, and especially if there is any history of syphilis, it is, unfortunately, almost certain that he is the victim of this grave and fatal disease.

Should some of these symptoms be absent or obscure, differential diagnosis must be made between alcoholic mania in which egotism may also be exaggerated; meningitis in which you have marked febrile symptoms with early delirium; multiple sclerosis which for a time may closely resemble paresis; brain tumor in which exaltation and delusions of grandeur are absent, and senile dementia occurring only in the aged.

Prognosis—From the history of general paralysis of the insane it is obvious that the prognosis is very grave, and that it almost invariably progresses to a fatal termination.

It is a question if the reported cases of recoveries may not have been mistakes in diagnosis, or cases of false paralysis such as are sometimes seen in alcoholism.

Treatment.—This can best be given in institutions where freedom from excitement, protection from liability to accidents and fatalities, with proper nursing and care is available. With a specific history, active mercurial treatment offers some hope in recent cases.

Insomnia must be overcome as in other forms of insanity. Cold water baths and central galvanization are likely to increase excitability, and give no relief. Good care to the fatal termination is the chief indication.

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THE ETIOLOGY, PREVALENCE AND TREATMENT OF HYSTERIA.

BY U. O. B. WINGATE, M. D., M. M. S. S., OF MILWAUKEE.

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In this brief paper I desire to state by way of preface, that I claim nothing original; I only desire to call your attention to a subject which, it seems to me, does not receive the attention from the profession that its increasing frequency calls for. For convenience I purpose to consider the etiology and prevalence of the disease together.

Hysteria is a degenerative psychosis, and, as Dr. Hare has very truly said, its treatment "requires more tact, perseverance, and industry than any disease in the domain of neurology." Until quite recently, although it has been recognized that it affects men as well as women, it has been claimed to be much more prevalent among women, but it has been shown by Marié and Souques that in the Paris hospitals hysteria is much more frequent among men than among women, and in this country it is becoming much more frequent among men than formerly.

The greater number of cases in both sexes is found in the middle classes, and it is in the lower classes that we observe the greater number among the male sex. Heredity, both direct and similar, plays a very conspicuous rôle in the etiology of this malady. Batault has shown that the transmission occurs most frequently through the mother. The earlier it occurs in life, if independent of accidental or external conditions, the more liable it is to be of hereditary origin. It is associated with all forms of degeneration, and this fact accounts for its frequency, no doubt, in this age in which we live, which if not one of degeneracy, is one that contains a

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greater number of degenerates than has been observed in previous ages; this fact can not be overlooked by any observing and thinking physician.

While direct and similar heredity is frequent, the indirect and dissimilar heredity is more frequent as an etiological factor. According to Féré it "is associated, both individually and in the family, with neurosis, psychosis, organic diseases of the nervous system, arthritism, tuberculosis, and all affections which betray a congenital vice of organization." The use of stimulants, both alcholic and drug, and disturbances of nutrition so common at the present time, together with overstrain in study, and business competition, and all conditions that result from the present fast life which we live, are prominent factors that lead to overthrow the harmony of the nervous system, and result in the condition of an enfeebled will-power, and to render the individual unable to maintain self-control. Any condition which may lead to depression of the nervous system, or any disturbance of nutrition, either mental or physical, may lead to hysteria, and such condition may be hereditary or acquired.

Strange as it may seem, the victims of this malady may, and often do, present the most healthful and vigorous appearance. A young married lady came under my observation in one of the most violent hysterical outbreaks that I have ever witnessed—she presented a most robust appearance, was large, unusually well developed, with a head of hair that nearly reached to the floor when she was standing; she was in good flesh, and all the functions apparently normal; she had a drunken father and a nervous mother. She had been indulged in every fancy before marriage, and because her husband, a hard-working and moderately well-to-do railroad man, declined to provide her with a new silk dress, claiming that he could not afford it, which was true, she proceeded to develop a fit of hysteria that called into service a physician and a nurse for a week, and in the meantime she managed to smash

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nearly all the furniture of her room. Another young single woman, after a slight misunderstanding with her lover, became unconscious for hours, and developed violent convulsions which required the services of a nurse and physician, and alarmed the entire household. This patient was chlorotic, and this condition is quite frequently followed by hysteria. It has been observed in children of both sexes, though it is more frequently observed in girls than in boys. It has been observed as early as eighteen months or earlier. It quite frequently develops after an injury as an exciting cause, though in these cases there is almost always a constitutional tendency. After injuries from railroad accidents, or after those which are accompanied with fright, it is quite common. In the cases which are predisposed there are many conditions which act as exciting causes, such as fright, anger, exaltation of the imagination, religious enthusiasm, vicious education, strange beliefs, stories of spirit-presence, ghosts, etc. In the youth of both sexes it not infrequently results from masturbation or excessive venery, and it is a common companion of neurasthenia, and many physical conditions resulting from general debility, and especially where the mind is in an anxious state from fear of evil or unfavorable results. It is quite frequently epidemic and contagious, affecting a large number in a community, especially after some local calamity or religious excitement.

Many of these cases are cured by Christian-scientists, or faith-cures, and the average physician is too apt to overlook these cases and fail to give them the attention that they are sure to get from some source, and hence he loses many a patient, and fails to get the credit which he might secure by a little more pains, as well as the remuneration which is justly his due.

Briquet held that diseases of the reproductive organs do not predispose to hysteria any more than other diseases, but it has been my experience that morbid conditions of the ovaries and testicles are especially liable to be followed by hys-

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teria, and quite frequently a mere functional disturbance of these organs is quite as liable, if not more so, to be followed by hysterical manifestations as are the more severe organic diseases. In other cases, however, we find the hysterical conditions remain after the removal of both ovaries and testicles; in fact, in some cases, the hysteria only shows itself after the removal of these organs.

Hysteria is quite common in prostitutes who have been indulging freely in alcoholic and drug stimulants, and it not infrequently follows autointoxication and poisoning from infectious diseases, and from mineral poisoning. It likewise follows severe hemorrhage, diarrhea, and over-work of all kinds. In the higher classes it may follow, in women of leisure, where the imagination is active, and where the vitality of the system is often lowered from want of healthy exercise, with indulgence in sensational reading and an active imagination. Finally, the hysterical show the signs of degeneracy, and it occurs in men who tend to the feminine characteristics, and in women who tend to the masculine.

In order to treat hysteria successfully, the physician must familiarize himself thoroughly with the nature of the malady, and as there are many agencies at work to this end, he must make a careful study of each case that comes under his observation.

In the young subject much can often be done by way of prophylaxis. The hereditary tendencies must be met by proper education and development. If the mother be a nervous, hysterical person, the child should be removed from her care, and a nurse selected that is properly qualified by temperament and training. All trained nurses will not do to care for these cases. Such a nurse should be free from nervous tendencies, and she should be especially trained for this kind of work. The child must be well-nourished and taught self-control as a first principle, and as she grows older she much be taught that the world was not made for her especial

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benefit, and that she can only obtain concessions in proportion to her willingness to grant them. The child should be made to associate with children free from all nervous and hysterical tendencies, and must be guarded against all occasions of violent emotion and cause of worry, and she must be especially guarded against a solitary or idle existence. This latter admonition must be considered with much care, for subjects of hysteria usually have a natural aversion to every occupation, hence much care and patience must be exercised in leading her in the proper direction.

All excesses must be carefully guarded against, either physical or mental, and girls at the age of puberty must be watched with the most intelligent care. In fact everything that tends in any way to depress the nervous energies must be studiously avoided, and on the other hand everything that tends to tone up the nervous system must be as studiously provided.

According to Briquet, one-fourth of the daughters of hysterical mothers suffer from the same malady. It is well that we consider the question of marriage in this connection. What breeder of stock would use animals for breeding purposes that would produce a progeny one-fourth of which would inherit a diseased condition? Besides this it is quite a frequent occurrence that hysterical subjects transmit to their descendants nervous diseases of the most varied sorts. Nevertheless absolute prohibition of marriage of hysterical women would undoubtedly inflict a great wrong, but there are many women who are victims of this malady who should be discouraged from marriage, for in such the consequences of the married state, together with child-bearing and lactation, would be followed only by the most disastrous results, not only to the married, but to the offspring as well. In many of these cases the physician is often obliged to assume the most tremendous responsibility in giving advice, and I am persuaded to believe that in the great majority of cases where hysteria

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manifests itself in the female at or after puberty, he is only justified in sounding that famous admonition of *Puck*, "don't!"

In the treatment of hysteria where the malady has become established, we must take our cue from the nature of the disease almost entirely, and if the teachings of modern neurologists are correct, which I have no reason to doubt, we understand the nature of this disease as well as we understand anything in neurology. In a word—it has been shown by Charcot, Féré, and their followers, that it consists of a fatigue or exhaustion, produced in the great majority of cases by malnutrition or functional disturbance, of the neurons of Waldeyer, which consist of the nerve-cell plus the axis-cylinder and other processes. To restore this loss of function is the problem to be solved in treatment. It has been found by experience that there is no better way as a first principle to restore lost nerve-function of this character, than by a complete change of the patient's accustomed life and surroundings. The patient should be sent away from home and friends. If possible, she should be sent to some institution or home where she can have special treatment, a complete change of nourishment, change of habits, and placed under the care of a trained nurse, trained to care for such cases. The process then should consist of building up the entire system in every possible way. Special conditions must receive special treatment. A life in the open air, moderate exercise, association with those who are free from nervous tendencies, tonics, nerve sedatives, nourishing diet, and a general course of education of the nervous system are all demanded. Suggestion is often of much benefit, but hypnotism proper, in my judgment, is not to be advocated. Hypnotism is in fact an induced hysteria, and tends to weaken the neurons rather than to give them tone, which is the object to be attained. Hypnotism may relieve certain symptoms, and may be called for in certain cases and under certain conditions, but the repeated use of it should be condemned. Electrical treatment is often of great advantage,

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especially the static current. Electric baths, two or three times a week, are often advisable, but they should be given with much care and not too often, and the dosage of electricity should always be light. General galvanism, or faradism, two or three times a week, and in seances of from five to six minutes, is often of much benefit. The static current is by far the most beneficial, but it should never be given to cause any discomfort to the patient. The shower-bath is also of much benefit in many cases, but the temperature must be carefully guarded, for in some, cold is not well borne, and the milder temperature must be substituted. Massage may be indicated and often is of great use, especially where there is very great weakness, and a sufficient amount of exercise can not be taken. An abundant amount of easily assimilated food must be always provided, and plenty of sleep must be had.

Certain symptoms require special attention. The convulsions are of the greatest importance. In such conditions hypnotism may be of use in warding off attacks, but it should not be continued, as stated before. A few whiffs of chloroform or ether may be administered, but better still, a pearl of nitrite of amyl broken into a handkerchief and inhaled, will act promptly and effectually. The old domestic remedy of throwing a pailful of cold water in the face of the patient in a convulsion of hysteria may be effectual, and perhaps justifiable if there is nothing else at hand, but it can hardly be termed elegant treatment at the present day. It is rarely necessary to hold the limbs of a patient in these convulsions, and the less attention paid to the patient the better after the proper remedy has been administered. Onlookers should not be allowed, as they make the patient worse by their presence. Pressure over the supraorbital nerves, which can be made to cause much pain, or pressure over the ovaries, may cut short a convulsive attack, but the latter may be undesirable in some cases for obvious reasons. The hypodermic use of morphin

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is not followed with the good results that might be expected. A dose of from ten to twenty grains of chloral hydrate in milk per rectum is preferable, and often serves a good purpose.

In cases of anesthesia, aphonia, spasmodic cough, mutism, deafness, amaurosis, pharyngeal spasm, paralysis, contracture, etc., cutaneous irritation by the electric brush, or sinapisms are indicated and are usually efficacious. Suggestion may also prove successful in some of these conditions, but it will take time to establish a cure, as until the lost function is fully restored we cannot expect these symptoms to be entirely relieved. Contractures often last a long time and require careful treatment. They should be met early with massage and electricity, and often the static current will be of great value. The visceral symptoms, such as hemoptysis, hematemesis, salivation, dyspnea, etc., call for no special treatment, but will be subdued by the general principles already indicated. Charcot called attention to the importance of isolation in cases of hysterical anorexia. Well-regulated discipline is of first importance in this condition, and the taking of food is to be insisted upon from the first, and the stomach-tube must be used without hesitation if the command of the physician is inefficient. Food is often vomited when taken, but retained if administered through the stomach-tube. Suggestion may be followed with good results in some of these cases.

In conclusion, we must first have a clear conception of the character of the malady and every case is a study by itself, but with careful study, patience, tempered with good judgment, we may expect our efforts to be followed with a fair share of good results. Hysteria must not be looked upon as a fault of the patient, but as a disease which calls for the closest care and attention of the physician, and unless we look upon it in this light we cannot expect to have our efforts followed by success.

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TREATMENT OF HYSTERIA.

BY DARWIN R. STOCKLEY, M. D., OF EVANSTON, ILL.

The term hysteria is applied to an unusually varied group of manifestations of functional disturbances of the nervous system. Defective hereditary endowment, unequal and inharmonious development, improper training, and unfavorable environment are among the predisposing factors. Exhibitions of lack of will power, of excessive emotional disturbance, of extreme susceptibility to external impressions, of great fondness for sympathy, and of a surprising simulation of other diseases, are among the characteristic symptoms.

The potentiality of hysteric symptoms is possessed by every one, and under favoring circumstances will be manifested. It is only in degenerates that hysteria becomes a disease. The frequent close resemblance to other diseases, and the common association of symptoms with those which have an organic basis, render the recognition of hysteria a problem of great difficulty.

While the prognosis of hysteric manifestations is not unfavorable, the successful treatment of the disease requires more tact, skill, and patience than any other disease of the nervous system.

The physician may first see the patient in a hysterical convulsion accompanied by one or more of the "stigmata." His first duty is to protect the patient from violence. Mechanical measures are usually employed, and the mind of the patient controlled by suggestion of the physician, and a tranquil, hypnotic state induced. Apomorphin is a favorite for speedily clearing up a hysterical paroxysm. It is an essential preliminary to dismiss from the presence of the patient all sympathizers and other unnecessary persons.

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Treatment of the disease itself cannot begin too early, and by surrounding the hysteric mother with a tranquil and unemotional environment, much can be done before the birth of the child which shall contribute to a better-balanced nervous organization in him. Before the child of such a mother reaches the age of ten years, for the benefit of both, he should be placed beyond her direction and control. In the education of such a child the advice of the physician should be sought, and uniformly followed, and every effort made to properly train the will and emotions.

Children of hysterical parentage are inclined to precociousness, morbid sentimentalities, mawkish sympathies, and abnormal sexual propensities. The successful treatment of such symptoms is in line with our modern educational methods, by which healthy out-door sports are encouraged, precepts of patriotism instilled, and generous feelings and hopeful sentiments inculcated. The democracy of the schoolroom and playground puts the mind of the hysterical child into balance, and he acquires self-control in adjusting himself to other and healthy minds. Pride is aroused, the sensibilities are quickened, and healthy ambitions take the place of abnormal self-indulgence.

No physician can be successful in treating hysteria who does not first win the confidence of his patient. A firmness that is not sternness, a kindliness that stimulates, a sympathy that offers no encouragement to emotional outbursts, an exhibition of control by suggestion, are among the attributes of the physician for the successful treatment of this disease.

To secure the best results the patient must be removed from home and from all the influences which have produced and which tend to perpetuate the morbid condition of the mind. Equally imperative is the employment of a proper nurse, one who can follow the directions of the physician. The so-called "trained nurse," taught to search for objective symptoms, will, by her methods of precision, furnish the pa-

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tient's mind with new symptoms and thus aggravate the disease by suggestion. Aside from suggestion of the physician in the control of an acute attack, there are no permanent results from the treatment of hysteria by suggestion. This is due to the ineffectual control which the patient has over his emotions.

The "rest-cure" has value when properly managed in the initial treatment of the severe forms of the disease. But an improvement in general nutrition, under any treatment that is unaccompanied by mental gain, is not a cure of hysteria.

The possibility of a physical cause for a hysterical attack should be recognized, and the disturbing factor removed.

Sedatives and antispasmodics are often indicated, and malnutrition will call for the usual tonics.

Hydrotherapy is enjoying not too much distinction, for its beneficent effects in treatment.

Hypnotism, electricity, extreme shock and vile drugs can offer no other than a temporary relief through the patient's extreme susceptibility to suggestion.

Surgical procedures, especially upon the generative organs, except for the purpose of restoring a pathological condition, are unscientific, and it is well contended that not a single cure is recorded as the result of removal of healthy sexual organs. The one bright, particular ideal to which all methods for the treatment of hysteria tend, is to secure in the patient a fixed resolve to accomplish some unselfish purpose. The physician and the nurse, ever on the alert for the manifestations of such a purpose, will encourage its development by every means in their power, knowing that an active spirit working outside of introspective and morbidly selfish aims, has no room for the development of hysteria.

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THE CIRCULATION OF THE NERVOUS SYSTEM.

BY HERMAN GASSER, M. D., OF PLATTEVILLE.

A germ-cell out of which is developed an insect, a fish, a bird, or a man, is as simple a cell, even though examined by the most experienced man with the aid of every means of scientific analysis, as is the epidermic cell, yet each germ-cell has a specific energy of its own, and even among the same species, each has individual characteristics in directing its development.

The simple germ-cell of the egg of a chicken practically without shape or form, assimilates along the organizing tendencies of its ancestors the albumen with which it is surrounded, and builds up a living organism of bones and muscles, feathers and nerves, the organizing tendency of which, when hatched, is no longer circumscribed by the egg-shell.

In this way by the labors of a host of scientists, beginning with Von Baer, what we first imagined to be very complicated phenomena, upon their analysis into their simple constituents come readily within the mental grasp along the basic lines of general principles, and give us an orderly conception of the mechanism of the organizing material tendencies, or the unfolding of the ancestral memories regularly and systematically, limited always in the absorption and assimilation of energy by its then state of existence.

"A chick which creeps out of its shell at once runs about, as did its mother, when she, as a chick, broke her shell.

"Think how extraordinarily complicated are the motions and sensations of such acts! Only consider the difficulty involved in the equiposing of its body in running, and it will be conceded that the supposition of an innate reproductive faculty alone, can serve as an explanation of these intricate performances.

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"Without hesitation it picks up the grains that are thrown to it. This implies that it sees them, and that it correctly judges their position and their distance; moreover, it has to move its head and other members with great precision.

"All of these things could not have been learned in the egg-shell; they were learned by the many thousands of beings which had lived before this chick, and of which it is the direct offspring. Such surprising performances of animals are generally called instincts; and some philosophers have indulged in mystic explanations of instincts.

"If instinct is regarded as the result of memory, or of the reproduction-faculty of organized matter, if we assume that also the race is endowed with memory, instinct is understood at once; and the physiologist is enabled to correlate and connect instinct with the great series of facts found to be phenomena of the reproductive faculty.

"Such a feeble irritation as the rays produce which proceed from the grain and fall upon the retina of the chicken form the occasion of the reproduction of a complicated series of sensations, perceptions, and motions, which in this individual have never as yet been combined, and which, nevertheless, from the beginning were adjusted with accuracy and precision, as if the animal itself had practiced them thousands of times." (Hering.)

The brain of an animal is from birth almost matured, while the scope for individual development in the case of the human brain is much larger, because a relatively greater part of its development is relegated to the time subsequent to birth. It grows under the influence of its surroundings, which affect its senses, and acquires under such circumstances, in a more individual way, what the animal has received in the fixed formation of the race.

Movements are much more complicated and artificial, adaptation is no longer easy and instinctive, but is laboriously ac-

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quired. It demands the exercise of choice, repeated endeavor, effort, and at the beginning is accompanied by fatigue, but the end sought is to prevent diffusion by coördinating the movements into simultaneous groups or series.

In this way dexterity is acquired, and with sufficient limitation produces virtuosity, for nutrition builds along the lines of irritations, and so become the organic expression of the individual memory, that irritations similar in kind will discharge with greater ease, energy, and rapidity, and eventually as instinctively as any well established series of reflex actions.

From this point of view, "Home, Sweet Home," with the pure tone and harmony of modulation of a Patti that delights our senses, because all useless movements and overtones are eliminated, becomes an instinctive action, an organized memory, the history of which is the evolution of the past with the development of the present.

This organized memory is not alone in the brain as is commonly believed, but also in the nerves, sensory and motor, and the muscles are trained; it is their memory or matter organized to discharge energy in a certain definite way, and are, hence, also susceptible of training.

This product of the unconscious memory of organized matter is the fundamental principle of the science of heredity; it is the history of the development of man in common with every organic being in existence to-day, "the latest links of an immeasurable series of organic beings, of which one rose into existence from the other, and one inherited part of the acquired properties of the other."

To the beginner on the piano, how slowly he finds the single notes, with what difficulty he adjusts the muscles to find the keys, and then how marvelous the play of the virtuoso.

With the swiftness of an instinct or reflex action each note

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finds an easy passage through the eye to the finger without waste, diffusion, or thought, in their customary tracks.

All this is possible only because these practiced irritations have become organized in the matter of, not only the brain, but the nerves and muscles. Such activities as these are not phantoms, or photographs stored away somewhere "within the soul;" indeed, they have no existence at all except in the material organization built up in the organism, whereby it is capable of reviving the same series of organized irritations, for "stored up knowledge is not a mental state, but a capability of being put into a mental state." (J. S. Mill.)

It is the unconscious memory of the material organization. The first conscious experiences were possible only by virtue of a physical organization to receive them. They do not continue as images or experiences, but only as dispositions of the nervous substance that becomes better organized, and by virtue of which may be reproduced. To this unconscious memory or organization of the nervous system we owe all our ideas and perceptions; the oftener they are repeated the more perfect they become. What at first was acquired with difficulty, eventually is performed with ease. In this way, too, every germ passes through that "series of phases which were developed and fixed, step by step, in the memory of organized matter in the series of its ancestral beings, during a life of incalculable duration." This, again, is what we call heredity; the shortening of the process of growth and development by the adjustment of the forces in material organization, and so doing in a few moments, what it took untold ages to accumulate. This is its organic history.

"A far-reaching memory, or reproductive faculty, we must assume, is to be ascribed to the whole body, as well as particularly to the brain of a new-born man. By the help of this memory he is able to acquire the attainments which were developed in his ancestors some thousand times and are necessary for his life, much more quickly and easily. What

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appears as instinct in animals, in man appears, in a freer form, as a predisposition.

"True, ideas are not inborn in an infant, but the ability of ready and precise crystallization of ideas from a complex mixture of sensations, is due, not to the labor of the child, but to the labor of innumerable ancestors.

"Theories of individual consciousness, according to which it is assumed that each human soul starts life from itself and commences a development of its own, as if thousands of generations before it had not been in existence, are in striking disagreement with the facts of daily experience." (Hering on Memory, p. 25.)

"Man, (says Prof. Marsh,) cannot see, or hear, or smell, as well as many lower animal, but he can coördinate his impressions into more elaborate ideas than any other animal can create; hence all other creatures are at his mercy." At the expense of the better organized and specialized instincts, he becomes sensible to a greater number of influences or sensations in the environment in space and time that cause the intellectual life to develop more slowly, for the matter of the brain is the latest development in the history of evolution, and the latest in organization.

Upon this general fact is founded the whole system of education and training, for "the distinctive work of a college (says Prof. Dwight) is to develop thought-power in those who come to it for the education which it has to give."

"The mind (brain) is to be disciplined and developed in its own working powers," and after the same manner as the training of the blacksmith develops the working powers of his arm.

It is the education of the inherited faculties predetermined and predisposed to respond to irritations by its inherited material organization.

In an organism, all the varied forms of life, even to the cells, are held together in one coherent unity, or consensus, by the nervous system, and every irritation is tranfused and

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reechoed to its remotest parts. "Every part of the nervous system is every instant traversed by waves of molecular change, here strong and here feeble. There is a universal reverberation of secondary waves, now arising in this place, now in that; and each nervous act thus helps to excite the general vital processes while it achieves some particular vital process." (Spencer, Psychology, p. 96.)

Through it is held together the whole complex and aggregated organism, and the sum of its activities we call its life, the very definition of which "is a continuous adjustment of inner with outer relations," and assumes the hypothesis of a circulating energy of the nervous system.

As the various internal functions of the organism, in common with the incitations of the outer world carried by the sensory nerves, act with varying rapidity and power, there necessarily must be equalizing and controlling centers, the adjustment of which gives rise to the state of conscious feeling.

If every sensation sent from the periphery and the internal organs were alike, of equal and regular wave-length and strength, there could be no equilibration of varying forms of nervous energy, and hence no states of conscious feeling.

If, as some hold, all irritations of the nervous fibers were similar in character, of equal wave-lengths, they would then, to produce differences of relations of feelings, have to be absorbed and adjusted in dissimilar form by the local special energies of the brain to produce consciousness.

The general scheme of the functions of the nervous system is an ingoing movement, a central elaboration, and an outgoing movement in the circuit of which appear the phenomena of consciousness as a function of its circulating energy.

The auditory nerve receives the motions of vibrating matter, the optic nerve luminiferous vibrations, the nerves of the skin, touch and temperature, that gradually unite and coalesce within the brain. The function of each is of a specific kind by stimuli of all orders. An electric current through

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auditory nerve produces sound; through optic nerve, sensations of light; the gustatory nerve, taste.

No matter what the stimulus, a blow, a ray of light, or an electric current, it invariably manifests itself as sensations inherent in certain nerves. It is the condition of the substance of the special nerves of sensation that causes a specific reaction. It is the coördination of the different sensations of varying rhythm in the cortical cells of the brain that gives rise to states of feeling and consciousness, and the study of the coördination of these activities becomes an analysis of the involved interaction of the cerebral function.

The theory of a circulating energy of the nervous system with the nerve-cell, or neuron of Waldeyer, as isolated anatomical units, is untenable. That there is a physiological connection between them, all must admit.

The fact of continuity is of much greater value than the histological structure as understood by the most improved methods of staining; especially so when it is not in harmony with well-established phenomena, and you must appeal to the imagination to fill in the gap.

In the latest anatomical analysis by F. Apathy, there is a return to the older conception of nerve-fibers entering ganglionic cells, and with it a return to the philosophic unity and harmony between anatomy, physiology, and biology.

The continuous activity of the heart, lungs, and muscles of respiration to maintain the organism in equilibrium, must constantly receive the multitudinous impulses from every portion of the body with a concentration of the circulating nervous energy.

This we find to be demonstrated by experiment. If one has ever witnessed the simultaneous division of the vagi in a dog, he was startled by the amount of energy that was drafted off and that they held in check. The effect is similar to that of cutting an important artery. "We know from daily experience, (says Foster), of all the psychical nervous cen-

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ters, the respiratory center is the one which is most frequently and most deeply affected by nervous impulses from various quarters."

But not only the respiratory muscles and the heart are held in this sustained tonic activity by the nervous energy, but all the muscles of the body. They are never in a state of absolute rest. The positive activity of the one side is negatived by the activity on the other side and keeps them in tonic contraction. They are balanced by the equilibrating forces of the nervous energy.

That the condition of the blood has a great influence upon respiration and the action of the heart is also familiar.

As the blood becomes more venous, the sustaining and equilibrating centers become relaxed, and the respiratory and heart-functions become more vehement, until at times they bring into play almost every muscle of the body. These have been called the inhibitory centers, and have become a stumbling-block in physiological interpretation.

If the circulation of the nervous system with specific energies of its local functions is true, then the carbonic acid becomes a stimulant to heart and lungs, and oxygen a sedative, and in this way the circulating energy of the entire organism brings about the self-regulating action of the heart and lungs, so that the mere mechanical expansion of the lungs transmits along the vagus an impulse to the respiratory center that the oxidation is sufficient, when it eases up and brings about an expiration to draft off carbonic acid.

In this way the respiratory mechanism is brought into close communion with every part of the body. "We should accordingly expect to find that the vaso-motor nerves were connected with, and arterial tone regulated by, the central nervous system, in order that the caliber of the arteries of, and the supply of blood sent to, this or that vascular area might be varied according to the varying needs of the economy. And experience proves this to be the case." (Foster.)

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Increased blood-pressure stimulates the cardio-inhibitory center in the medulla, and brings about a slowing of the heart-beat, while section of the vagus or decreased blood-pressure augments its action. If we keep in mind the fact that the inhibitory centers are continuously swinging between the constructive and destructive forces of the organism to maintain its equilibrium, then the destructive forces of carbonization means their stimulation to increased activity, while oxidation means their cessation of action by the increased forces of control.

If the circulating energy of the nervous system has the power to contract a muscle, it also has the power to inhibit it. This we find not only to be daily experience, but demonstrated by experiment.

In the coördination of nervous energy, the arrangement is such that when abnormally active and its chief centers surcharged with blood, they arrest or inhibit the organ which propels it, by their organized restraining influence of reflex action to create equilibrium; otherwise we would not exist.

This is true not only of simple reflex action and inhibition, but it is equally true of those muscular actions by which we impart ideas, for they too can at any moment be inhibited.

I will to move, or I will to stop moving, have the seat of their actions in the same elements, and are located principally in the frontal lobes of the brain. The difference between the simple reflex action and the highest form of intelligence, is one of degree only of the development of the nervous system and its higher ganglia, and the physiological and the moral power of control is dependent on their size and quality.

They are the centers of inhibition. It is there the multitudinous sensations of varying forms and strengths are elaborated into one general unity, and in which the systematic and cultured coördination is the measure of the intellectual operations.

This again suggests the conclusion that moral conduct is

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more dependent upon the size of frontal lobes, and the influences of the forces by which they have become organized, than to the irregular conformation of face and skull.

We can observe how a ray of light or a wave of sound is transformed into an irritation or increased stimulation of the nerve-fibers and conducted to the brain-cells, but here we lose all trace of it in the labyrynthian connections of the infinitely involved processes.

Here emotions, thoughts, conceptions, and volitions arise out of the sensations sent to it. Here we are at once transposed into the field of psychology, and between it and physiology we find there is an inter-connected material process accompanying conscious existence.

On the other side of its transit through the brain, we see the volitional efforts of the limbs and hear the spoken words.

Thus we find an inalterable order along the lines of fixed laws, connecting the conscious life with the functions of the body. It cannot be that the sensations after having arrived in the brain become immaterial states of existence, to be again drafted off on the motor side of the nervous system as material functions.

The chemist and physicist may analyze the elementary matter, formulate it into a systematic series of molecular and atomic structure, that is ever changing in form, but unchanging in quantity, yet its ultimate composition transcends all his knowledge. We may call it "material" or "spiritual," it matters little, for the one, as well as the other, is as much an enigma; unknowable forms of existence, "figments of the imagination embodied in words of learned sound but little meaning," valuable only as weapons to frighten and anathematize the ignorant, weak, and credulous.

Our passions and hopes, ever ambitious to fly the bounds of ordinary experience, may cause sublime and delightful states of feeling and aspiration, but as legitimate subjects for scientific speculation must be regarded with the same impar-

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tiality as the other natural mental phenomena, for as Kant says "in those matters which concern all men alike, nature is not guilty of distributing her gifts with partiality; and that the highest philosophy, in dealing with the most important concerns of humanity, is able to take us no further than the guidance which she affords to the commonest understanding."

The difference between the educated and uneducated is principally one of the power of using language to express with accuracy and precision, thoughts and feelings.

The motor element of ideal vision and thought is speech, but the words and language are not thoughts and feelings, but only the symbols by which we try to express them, just as the feat of the athlete is the symbol of his musculo-nervous condition.

Again, what is the difference between the bestial sexualism of simple untutored man, and the chivalrous love so carefully and voluptuously analyzed in one of our recent family magazines?

Words, only words.

In the nervous system as in the circulatory system, it is not alone the material substance that controls the organism, but the forces that act through them that determine their function.

The potential energy of the nervous system is itself the result of intermolecular and chemical actions taking place within the organism. The energy taken up by the nervous system is much more plastic, mobile, and elastic, than that of the circulatory system, and hence diffuses it with greater rapidity, thus exercising a controlling and determining power of all the other functions of the body.

Here, too, there is a general similarity of principle between the food-energy taken up by the circulation of the blood, and the energy taken up by the nervous system. The difference is one only of degrees of density and plasticity. All the organic substances of varying kinds may be classed

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as the physical basis of food. The dead beef and bread are metamorphosed by the physico-chemical laboratory of the alimentary canal and taken up by the circulatory system as living pabulum that has nothing in common with its previous state, for "the dead matter of the universe has been converted into the living matter of life." The transition, too, is so involved and complex, that at no moment can you say, now it is the one, now the other.

This is equally true of the physical basis of the varying forms of energy. When the forces of light, heat, taste, smell, and pressure enter the living matter of the nervous system, and into the mass of the organism, they are not destroyed.

If we can no longer recognize them, it is because they are transmuted into life, into the various forms of nervous energy, in the circuit of which they are known as sensations, feelings, and volitions.

Another and equally wonderful comparison between them is that one part of the digestive tract and of the circulatory system is peculiarly fitted to perform special functions, so there is, also, a special division of "specific energies" of the nervous system. Not only the external, but the internal, parts of the organism continuously send nervous pulses specific in kind to be elaborated and adjusted by the central system into a general equilibrium or unity. From the simple incoherent motility and irritability of the germ-cell long before muscles and nerves exist, by regular and gradual development in connection with the environment in which it lives and out of which it grows, until it has reached the perfect coördination and adjustment in the highest type of man, we see the same forces at work along an established and regular order. This is sufficient to explain the mystery, but what the reality is passes all understanding.

The plastic and impressionable brain comes under the influence and discipline of the external world, it takes up such

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forces as it is capable of, and so moulds individuality, and character.

It is because the cerebral cells are subject to the educating influences that there is a varying morality between men, that cause some to rise to angels and other to fall below the brutes. And between man and the lower animals because the latter are more instinctively organized and hence incapable of great diversity of coördination.

By this time, no doubt, you might say of what interest is this to the physician? Generally speaking, at least this: general principles give comprehensive conceptions.

He may not understand the details of every conscious conception, but a knowledge of its general laws will prevent him from being led into the oasis of "every metaphysical Sahara and coming out seemingly refreshed." He will understand that there is no more possibility of transmitting thought, *per se*, across continents and oceans as claimed by telepathists and spiritualists than there is between the cylinder of one gramaphone with another.

It eliminates and weeds out an extensive field of delusions, and the energies can be directed to an acquaintance and study of the physiology of the senses and functions of the organism without which he cannot have an intelligent conception of psychology.

"In truth (says Huxley) the laboratory is the fore-court of the temple of philosophy; and whosoever has not offered sacrifices and undergone purification there, has little chance of admission into the sanctuary."

Witness, for instance, how physiology and psychology have revolutionized and reëstablished the domain of insanity; in times past it was believed that the "will" and the "mind" was in possession of some unclean spirit, but is now interpreted as the direct effect of physical disease. This illustrates, too, that "old ideas are not necessarily true ideas" because they are old; and because they are old and moss-cov-

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ered with tradition, is no reason why we should renounce our reasoning faculties that we may receive them with a "reverential awe," no longer subject to comparative analysis.

While the circulating energy of the nervous system adjusts the body to the ever varying conditions of the external world and maintains it in health, it is because the stored-up energy and vitality is in excess of the usual requirements.

But let a gradually developing pathological condition arise, the result of some infection or contagion, wherein we have a struggle of organisms for ultimate supremacy continuing their conflict for some time, and the constant strain will ultimately cause a rupture of the equilibrating forces of the nervous system, that displays itself by suddenly breaking out with acute disease in full bloom; the intensity of which is usually the measure of its virulence, and the power to resist the vitality of the organism.

In that purely physiological disease sunstroke, in an otherwise healthy man, with high temperature and loss of consciousness, there is an acute disturbance and change of the cells of the cortex and cerebellum, resulting from the continued excess of heat causing exhaustion of regulating forces and rupture of equilibrium, often so severe as to cause speedy death.

Under such conditions the immediate abstraction of heat by whatever means is the method of treatment, and the more rapidly it is accomplished, the less destructive the process, and the more complete the recovery. In this disease the symptom-complex somewhat resembles a fit of epilepsy.

There is, it is true as a rule, no fever in epilepsy, but in both there is loss of inhibitive power of the brain and consciousness. The expenditure of energy is no longer directed by thought, but is drafted off along the lower reflex centers irregularly and spasmodically in the form of convulsions, and what was lost by thought, the inhibitive power of the brain, was gained by motion.

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The converse of this is equally true, what is gained by thought is lost by motion. The young girl on a railroad crossing before a rapidly approaching train is so absorbed and overwhelmed by the thought, that it consumes the whole of her nervous energy and vitality; she loses all power of movement, and thereby her life. She willed to move but could not because all the disposable nervous energy was consumed by the thought. "To think is to refrain from speaking and acting."

The hypothesis of the circulating energy of the nervous system also gives us a general interpretation of the phenomena or symptoms in those nervous diseases like palsy, chorea, and ataxia, resulting from degeneration of nerve-centers with consequent disturbed and irregular transmission of nervous energy.

The balance of the muscles that in health held the limbs steady, become irregular, tremulous, and incoördinate. The energy is not sent into them in sufficient volume and regularity, thus failing to check now the one set, now the other.

This is also illustrated in therapeutics. Strychnin is a stimulant of the ganglionic centers, with increased activity of the whole nervous system and all the vital functions, thereby causing increased arterial tension, slowing of heart's action, and increased tension in the muscles, with a general exaltation of the vital powers that is continuous in character.

Cocain causes a weakening and change of function in the nerves to which it is applied, and with the changed and weakened function there goes a constriction of the blood-vessels with weakened local circulation, thus aiding exhaustion of sensory nerves and favoring anesthesia, so that irritations like surgical operations, ordinarily very painful and destructive, are not registered in consciousness, for the disturbed rhythm or change of function is so great it cannot be coördinated therein. By increased dosage this spreads to the general organism, the heart's action gradually getting weaker

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and faster. At the same time the loss of power of motion is almost proportionately as great as that of sensation, but not so localized, and the "sense of well-being" resulting from disturbance of coördination of sensations with changed state of feeling, is a delusion and snare, because the circulating energy of the nervous system is weakened after the same manner as in alcoholic intoxication.

In a normal or ideal brain-function there is a diffused general activity. The circulating energy of the varying peripheral sensations enter local portions of the brain with locally increased function, and the adjustment, assimilation, and organization with the other functions is the equivalent of the perpetual alterations of the organism expressed in states of conscious feeling. This is why consciousness exists only under the conditions of perpetual change. "The most perfect coördination is that of the highest wills, of the great men of action, whatever be the order of their activity. Cæsar, or Michael Angelo, or St. Vincent de Paul. It may be summed up in a few words: unity, stability, power. The exterior unity of their life is in the unity of their aim, always pursued, creating according to circumstances new coördinations and adaptations.

But this outer unity is itself only the expression of an interior unity, that of their character. It is because they remain the same that their end remains the same. Their fundamental element is a mighty, inextinguishable passion which enlists their ideas in its service. This passion is themselves; it is the psychic expression of their constitution, as nature has made it.'" (Th. Ribot, Dis. of Will, pg. 128.)

In those persons with small storage of nervous and vital energy, with a weak and limited coördination of ideas and feelings, that have no well-formed will of their own, and are hence the easy victims of the ideas forcibly impressed upon them by others, we have those states of feeling we call hysterical states of consciousness.

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By the general mimicry of the nervous system, coupled with a weak and imperfect organization, they become the victims of all the varied forms of functional nervous diseases that we classify as hysteria; the lack of "stability, unity, power."

In these unstable conditions of the nervous system, adjustment cannot act because it is not enduring; it is governed by the whims and caprices of the feelings, emotions, and passions, destroying rational conduct by the inconstancy and change produced by the weak and incoördinate functions. There is no longer the possibility of choice followed by action. Mental activity persists as an irresistible impulse; this is its volition, but its concentration of attention and inhibition in time and space is almost annihilated.

It can longer choose in order to act. The potential energy of the nervous system is drafted off in the direction of its then controlling impulse or feeling. It is not, as commonly stated, an exaltation of the higher centers, but a weakening. It can no longer inhibit and store up energy for the purpose of adjustment in time.

In confirmed masturbation, where centers are weakened, a sight or thought may cause an orgasm. The same order of loss of motility, beginning with the higher forms, is a common observation as a result of the abuse of alcohol. The last, more complex and higher, but less organized development is the first to give way, until, eventually, it is incapable of attention and at the mercy of trifling whims. The power of inhibition, or coördination, is weakened. This is the alcoholic state of consciousness, the virtues of which, in the language of Oliver Wendell Holmes, "are like poor calico; they won't wash."

When the intoxication continues in great excess, the adjustment becomes so weak, there is eventually a rupture, with chaos of coördination and a wild, riotous, and incoherent mania.

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It is in persons with the hysterical constitution that hypnosis may be produced by suggestion or concentration of attention, until it reaches such a height that there is no longer comparison or choice with other states; it reigns supreme as an isolated, or hypertrophied, state of consciousness. The other functions of the brain are so drained and weakened that they sink down into the stream of unconscious existence, for the vitality is insufficient to sustain the whole.

In the first stages or milder forms of hypnosis, while consciousness is preserved, there is nevertheless a manifest automatism, with loss of volition to act; sufficient coördination to maintain consciousness, but insufficient impulse or energy.

As it deepens and concentrates the energy into a single thought or suggestion, it becomes, like all ideas and thoughts in general, composed of a tendency toward motion. It is a common experience that the concentration of attention caused from looking down from a great height, or into a yawning chasm, gives one the sensation of putting the thought or feeling into action, and some with difficulty restrain themselves.

We find that the circulation of the nervous system not only regulates with system and order the general functions of the organism according to physiological laws, but in the apparent chaos of mental life there is displayed an orderly succession, that, when we once grasp the general principle, makes psychology appear as a systematic science.

There is a school of modern psychologists, at the head of which is that distinguished scholar and student, Alfred Binet, that has been industriously at work endeavoring to establish a "psychic law" of "double consciousness," "two personalities," "two egos," in one person, to which I want to give a few moments attention, as it seems to me their deductions, from the analysis of their facts and experiments, go far to prove the hypothesis of the circulating energy of the nervous

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system and to cause their conclusions to fade out of the realm of possibility. Their experiments are founded almost exclusively in hysterical patients, patients with greater or less exhaustion of nervous energy and irregular and perverted coördination of sensations.

The general principle observed in the experiments upon hysterical subjects with anesthetic regions, resolves itself into the problem why the sensations therein provoked do not reach the general consciousness. That it is received by the other "ego" or sub-consciousness is (they say) determined by the appropriate responses and volitions.

But this is equally true of the frog whose brain has been cut away. A drop of acid placed upon his flank is rubbed off by the foot of the same side, and if that foot is held he rubs it off with the other. This is a reflex action, an appropriate response by the "other ego"; and when it becomes more complex, like the chick just hatched picking the grain of corn, we call it instinct; and as it rises still higher, becomes more complex, there is choice or volition and we call that reason and will. They are all parts of the same physiological process, with only a difference of degree, and all dependent on the innate faculties or memories of the material organization of which consciousness is but a feeble part of the whole, "a synopsis of it" that exists only under certain conditions of activity of the brain.

The anesthesia of hysterics is caused by a changed state of the nerves producing a change of function that may be central or peripheral, that not only is weaker but has a changed rate of activity after the manner of cocain-anesthesia, and is no longer coördinated with the regular and higher functions of the circulating energy of the nervous system that produce states of consciousness.

While there is an appropriate reaction to irritations although not reaching consciousness in the conscious subject, it does not necessarily mean there is "another personality" or

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"consciousness," but rather that it is the instinctive reflex action of the material organized memory, and examples of which every one may observe every day of his conscious and even of his sleep or unconscious life. To produce consciousness there must be a certain tension-activity and coördination of the circulating nervous energy in the cortical substance of the brain, of which there are varying degrees, not only in the same individual, but among different individuals, and of which clear consciousness is but a small part of total consciousness, in the same sense that distinct vision is but a small part of the whole of vision.

To produce intense and well-directed states of consciousness there must be a brain and nervous system capable of developing them.

The wonderfully adjusted and coördinated muscular system fastened to a symmetrical and compact bony frame-work, by training and organization may be developed into the poetry and power of motion of the athlete. So the cultured brain throws off well-organized and adjusted states of consciousness. The graceful skill and production of the athlete, like that of the orator or artist, is only the function of their organization, and after their performance, is gone forever, but that which produced them, that material memory of the organization, can reproduce them similar in kind.

Things and thoughts with which we are familiar, although foolish and even destructive, we give respectful hearing and at best receive with tolerance and indifference; but strange and new thoughts, especially when they come "across lots" of our established order of mentality, even though they be pure and true as nature, we are apt, at least on first impulse, to drive from the premises, often with spurred boots.

It is no doubt true, that all the leading physiologists, psychologists and philosophers are of the opinion that the idea of a circulating energy of the nervous system is untenable and in physics impossible. They all admit "nerve-

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currents" or "chemical transformation" or "molecular movements" of a local and special function of the nerves irritated, but nothing more.

The problem as it appears to them is: how can a special and definite sensation be harmonized with a general circulation of the nervous system? The reaction-time of a special sensation through the specific and specialized nerves is a measurable quantity, influenced largely by the state of attention, fatigue, and the varying influences and conditions of the body.

Where there are no special sensations rising specifically and definitely into consciousness, there is an equilibrium of the nervous system with an indifferent state of feeling, but as soon as there is a special irritation of some nerve of sensation, it is more active and intense for the time being, and stimulates the indifferent state of feeling into a definite state of consciousness. The general state of feeling takes a concrete form, and we call it an idea.

Thus consciousness results only as an adjustment or equilibration of the rest of the circulating energy of the nervous system in the brain. This coördination of irritations of varying wave-lengths in the brain, and their adjustment in time and space, causes an expenditure of the energy of the brain in the form of heat and waste products, with a change of the chemical and molecular structure of the cells; this is its function, and out of this complex expenditure and adjustment rise those states of feeling we call mind, as one of its functions.

Physiological and psychological experiment cannot reveal a mental act because we have nothing by which we can measure the rapidly changing rhythm of motion in the labyrinth of the brain. We can only observe the coarser form of energy in the form of heat, waste products, and chemical change.

The bile is not liver, neither is urea a kidney. This is equally true of mind. It is not, and never can be brain, but like the others it is a functional product of the brain. It is true

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we cannot, like the other products, handle it and put it to physical and chemical tests, but this is because, like all forces in general, it is too elastic for our manipulation. While incapable of proof, yet its related existence is demonstrated by the very science of physiology and psychology.

No other hypothesis gives us such a rational conception of the continuity of life. The circulation of the blood carries only the coarser material substances, to be elaborated into the higher and more complex forms of life carried on and held together by the circulating energy of the nervous system, in the same sense that the alimentary canal elaborates the material for the blood.

It is the only hypothesis that gives us an intellectual and comprehensive interpretation of mental phenomena. It is in harmony with all sound deductions in physiology and psychology, and with every moment of our daily life. It is a conception applicable to the simplest stages of organic nutrition up to the highest processes of feeling or thinking. To me it is a reality as definite as that of the blood, with no obstacles in physics, philosophy, or anatomy.

We cannot conceive the laborer in the field or factory, in the classroom or counting-house, in any other sense than as directing his circulating nervous energy in a special and definite direction, for work of all kinds is the directing of the indefinite nervous energy in special directions to produce results that may be corn or plows, or "ideas" of wider range that cannot be so objectively materialized or idealized, but are, nevertheless, related in kind. The effort exerted in any feat or act is adjusted, not by the muscles, nor by the blood, but by the direction and concentration of the nervous energy.

The function of the brain is a world of its own, and it is as difficult to determine exactly what thoughts, ideas, or volitions, will next come in control, or active existence, as it is to determine the manner of the winds, rains, and clouds, al-

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though we know they are determined in a regular and uniform manner in accordance with physical laws.

The physiology of the senses demonstrates that ideas of time and space, color and odor, are as much a material reality as "corn and plows."

Every sensory impression stimulates the special nerves and cells to increased activity and combustion, which nutrition builds up and organizes so that an irritation similar in kind is repeated with greater ease. This is memory. An impression that at first was received with only a limited and circumscribed consciousness, by continued repetition becomes more comprehensive, because the energy that at first was received and transmitted with difficulty, passes on with ease, allowing related impressions to become organized. This is education, the basis of knowledge.

It is upon this organic materialized memory inherited from our progenitors that depends our greater or less perfection, and the extent of our capabilities to react on the environment.

Everything which stirs in the "mind" is conditioned by its place in the system of nature, for no life can continue and no life exists without the constant reactions of the forces of the environment.

The physical coördination and adjustment of the "specific energies" of the nervous system is its psychical function, related in kind but more complex in composition, and the one as well as the other is an ultimate and irresolvable fact of conscious experience, and in the same sense as "that the form of the crest of every wave that breaks wind-driven, on the seashore, and the direction of every particle of foam that flies before the gale, are the exact effects of definite causes; and, as such, must be capable of being determined, deductively, from the laws of motion and the properties of air and water."

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DISCUSSION.

Before reading his paper, Dr. Gasser said: Owing to the limited time I will have to omit some of the statements upon which are founded some of the conclusions on the subject for discussion here this afternoon, the Circulation of the Nervous System, and if some of the statements sound perhaps somewhat dogmatic, they are, nevertheless, founded upon facts in experience.

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THE PATHOLOGY AND ETIOLOGY OF A CASE OF MULTIPLE SCLEROSIS OF THE SPINAL CORD.

BY SAMUEL H. FRIEND, M. D., OF MILWAUKEE.

In the investigations of this case the descriptions of the different levels were taken from transverse serial sections representing the average degeneration found. Weigert's hematoxylin stain was used for the nerve-fibers and ganglion-cells; carmin for the pial membranes, blood-vessels, ganglion- and lymph-spaces.

History.—Male, aged sixty-three, with a syphilitic history.

Pathology.—The degenerations found in this cord were: (1) the posterior and anterior nerve-roots without and within the cord; (2) many of the ganglionic cell-groups and fibers of the grey matter; (3) the white fiber tracts; and (4) the blood-vessels, lymph and ganglionic spaces.

In the lumbar region enlarged posterior root-fibers were traced: (1) to the posterior commissure; (2) into the anterior horn of the same side.

In the lower and upper dorsal areas the nerve-roots were entirely degenerated.

In the lower cervical region thickened and broken posterior food fibers were present.

In the upper cervical region the fibers were less enlarged than below, so that they could not be traced.

The anterior roots within the horn in the lumbar region were traced to: (1) ganglion-cells in the anterior horn; (2) into anterior commissure; (3) into the anterior pyramids; (4) into anterior ground-bundles; (5) into posterior horn of the same side.

In the lower and upper dorsal areas these roots were degenerated.

In the cervical areas the fibers were less degenerated.

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THE GREY MATTER OF THE CORD.

In the lumbar area the fiber-network was: (1) thick and irregular; (2) normally branched. Many cells in the ganglion groups were present.

In the dorsal area all fibers were absent or so much broken that connections could not be traced. The ganglion-cell groups were almost entirely destroyed.

The cervical area showed a slight differentation in the size of the fibers. The root and endogenous fibers, equally enlarged, could not be traced. The ganglion-cell groups contained some normal cells.

In the medulla the ganglion-cells of the nucleus funiculus cueneatus, graciles, and hypoglossal nuclei, and olive were degenerated.

THE DEGENERATED WHITE TRACTS OF THE CORD.

Degenerations in the lumbar area were: (1) fibers in the middle third of both the posterior tracts; (2) fibers in the crossed pyramidal tracts; (3) fibers in the lateral ground-bundles; (4) fibers in the anterior ground-bundles (marginal fibers around the anterior median septum).

Degenerations in the dorsal area were: (1) the fibers of the columns of Goll, bordering on the median septum, in the middle third; (2) the posterior root-zones; (3) the tracts of Lissauer; (4) the direct cerebellar tracts; (5) the antero-lateral tracts of Gowers; (6) the marginal area of the lateral and anterior ground-bundles; (7) some fibers of the crossed and direct pyramidal tracts.

Degenerations in the cervical area were: (1) the posterior internal tracts; (2) the direct cerebellar tracts; (3) the antero-lateral tracts of Gowers; (4) the lateral and anterior ground-bundles around the margins; and in the upper cervical region the marginal area of the lateral ground-bundles; (5) in the lower section, some fibers of the lateral and anterior pyramids,

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and in the upper section, no marked degeneration of these pyramids.

In the lower medulla these tracts showed less degeneration. The direct cerebellar tracts and the antero-lateral tracts of Gowers were degenerated to the border of the crossing of the pyramids to the olive; these tracts then showed but slight degeneration. About the lower extremity of the restiform body these two tracts were again excessively degenerated.

THE BLOOD-VESSELS, LYMPH- AND GANGLION-SPACES, AND PIAL MEMBRANES.

In the lumbar section in both the grey and the white matter, the walls of all the blood-vessels were much thickened. The lumina of all vessels were slightly increased in size, yet all were patulous. The same condition existed in the pia. Many lymph- and ganglion-spaces were present.

In the dorsal cord I found one artery in the grey commissure on the right side with walls much thicker than in the lumbar area, having a very small lumen. On the left side of the commissure a thick band of fibers indicated the remains of another artery. All of the small arteries in the grey and the white matter were fibrous cords. In the pia the large arteries and veins had a small lumen. The lumina of the small vessels were not present. In this area the pia also showed spots of sclerosis. Lymph- and ganglion-spaces were absent. The pia was greatly thickened and was attached around entire cord.

Within the cervical cord the walls of all blood-vessels were much thickened. The lumina of some of the largest and a few of the medium-sized arteries were patulous. None of the capillaries had a lumen. In the surrounding tissues red blood-corpuscles were found in both the grey and the white matter, indicating thrombosis and extravasation.

In the pia the large arteries had a lumen. The walls of these arteries were thickened. Some of the smaller arteries

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were destroyed by embolic stoppages and showed extravasations.

The lymph-spaces within the grey and the white matter were present. A few ganglionic spaces were present. The pia was much thickened and was partly attached around the cord.

In the cervical area showing the crossing fibers, all of the blood-vessels had thickened walls. In this part of the cord within the grey and the white matter I found no large arteries.

Many of the smaller arteries were fibrous cords. No extravasations of blood were found. In the pia the walls of the vessels were thickened. The lymph-spaces were present in normal numbers. Some ganglionic spaces were present. The pia was thickened and in places was attached to the cord.

In the medulla, at the lower extremity of the olive, the blood-vessel walls within the cord were thickened. A number of capillaries in both the grey and the white matter were degenerated to fibrous cords.

The blood-vessels of the pia showed the same pathological condition.

The lymph and ganglionic spaces within the cord were present.

In the medulla, at about the lower extremity of the restiform body, the blood-vessel walls were thickened. Spots of total destruction of tissue were found, (1) in the olive; (2) in the degenerated cerebellar and antero-lateral tracts; (3) in the grey matter of the floor of the fourth ventricle. These spots could be directly traced to a thrombosed artery.

The pia showed thickened blood-vessel walls and obliterated vessels. The pia, also, showed areas of destroyed tissue. An artery, surrounded by red blood-corpuscles could be traced into the degenerated cerebellar tracts. The artery on the left side showed more hemorrhage than the one on the right side.

The lymph and ganglionic spaces were present in varying numbers. The pia was thickened and was firmly attached to the cord on the lateral borders.

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ANATOMY.

1. The position of the degenerated posterior root-fibers of the cord in the columns of Goll and Burdach, has been already detailed. Following the degenerated fibers of the tracts of Goll from the lumbar to the cervical region, a gradually decreasing degeneration occurred bordering on the median septum in the middle third. The highest degree of this excessive degeneration was seen in the lower cervical area. The degeneration then grew less toward the nuclei.

According to Edinger,[1] the median septal fibers have their origin in the lower part of the cord. Edinger's explanation of the disposition of the root-fibers in the tracts of Burdach and Goll is as follows: "As the posterior fibers enter the horn, some fibers go into the column of Burdach. As the fibers enter the tract of Burdach at the higher levels, they push the older fibers toward the centre. This process gradually produces a differentiated tract of Goll."

According to the degenerations found in the posterior nerve-roots and columns of Burdach and Goll, this case gives evidence of the truth of Edinger's researches on the origin of the median marginal fibers in the tract of Goll.

2. The thickened fibers of the posterior roots in all parts of the cord, and the degenerated ganglion-cells in the posterior, middle and anterior horns, and the degenerated fibers of the posterior and anterior commissures, indicated that the secondary sensory tracts, shown by Edinger,[2] were degenerated.

3. The absence of the fibers of the direct cerebellar and antero-lateral tracts up to the upper portion of the cervical area were undoubtedly caused by the degeneration of fibers from the ganglion-cells in (*a*) posterior horn, (*b*) middle horn, and (*c*) Clarke's column. Campbell (*British Medical Jour-*

[1] Vorlesungen uber den Bau der Nerviosen Central Organe, funfte Auflage, 1896, p. 324.

[2] Same, p. 331.

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nal, September 22, 1884, p. 641,) reports one case in which he observed "a partial descending degeneration of the direct cerebellar and antero-lateral tracts in the upper part of the cord, and an entire degeneration of these two tracts in the lower part of the cord after a thrombosis of the left posterior superior cerebellar artery." He also observed that the cells in the column of Clarke on both sides were small.

As already detailed, I found hemorrhages and localized destruction of tissue situated in the lower extremity of the restiform body. The hemorrhages could be traced into the region of the direct cerebellar and antero-lateral tracts in the upper part of sections. In lower sections of this area the degenerations were found, though there were no hemorrhages. These degenerations descended about 1^{cm}. Below this point the direct cerebellar and antero-lateral tracts appeared almost normal and continued so to a short distance from the crossing of the pyramidal fibers.

4. The degenerations in the anterior and lateral ground-bundles could be traced directly to the diseased ganglion-cells and fibers in the posterior, middle, and anterior horns.

5. The degenerations in the anterior pyramids were caused by a destruction of the ganglion-cells in the anterior horns, making up the secondary motor tracts.

6. The degenerations in the crossed pyramidal tracts were caused by a destruction of tissue.

7. The columns of Clarke were entirely degenerated in the dorsal and cervical areas, corresponding to the degenerations in the direct cerebellar tracts.

ETIOLOGY.

The pathology of this case indicated that the disease acted primarily upon the blood-vessel walls. All of the blood-vessel coats had undergone a fibrosis with proliferation of the fibrillar cells. The walls of the vessels in the different areas showed two degrees of thickening indicated by the lumen: 1,

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thickening with narrowing; 2, thickening with obliteration. The process of obliteration progressed directly by contraction, indirectly by thrombosis.

The blood-vessels of the dorsal area were narrowed and obliterated. In this area the ganglion-cells showed the highest degree of atrophy and total obliteration. The fiber-tracts were extensively degenerated; ganglionic and lymph-spaces were entirely obliterated; pial membrane were excessively thickened; in places the ground-matter was destroyed; entire dorsal area was contracted.

The blood-vessel lumina in the lumbar area were narrowed. In this area some ganglion-cells were granular, some atrophied, and some obliterated; some ganglionic and lymph-spaces were destroyed; white tracts were slightly degenerated; pial membranes were less affected than in the dorsal area.

In the cervical area the blood-vessel lumina were narrowed, and small vessels were obliterated with blood-corpuscles in the tissues. The degenerations of the ganglion-cells, ganglionic and lymph-spaces, white tracts and pial membranes, were not as extensive as in the dorsal area, but more so than in the lumbar area.

In the lower part of the medulla similar conditions were noted, as noted in the cervical area.

In the upper part of medulla with narrowing and obliteration of some of the larger vessels by the indirect process of thrombosis, the ganglion-cells, white tracts, ganglionic and lymph-spaces, and the ground-matter, showed considerable degeneration.

The character of the degeneration of the ganglion and pial cells, ganglionic and lymph-spaces, indicated that we had in this cord an atrophy of starvation. The destruction of the tissue of the cord and pial membranes in the dorsal and upper medulla areas was directly traced to a destruction of the blood-supply. I conclude that the degenerations of this cord

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were in a direct proportion to degenerations found in the blood-vessels.

The character of the degenerations of the vessel-walls indicated that the cause of the change was not the poison of syphilis. In syphilis we have a granulation-hyperplasia; in this case the process was atrophic.

I am indebted to Prof. Ludwig Edinger, of Frankfurt am M., Germany, for this spinal cord.

DISCUSSION.

At the conclusion of the reading of his paper, Dr. Friend said:

Marie in 25 cases found that typhoid fever was antecedent in 11. Pneumonia, malaria, scarlet fever, and especially small-pox have been followed by multiple scleroris. Totzke quotes cases published by Leuch, where the mother had the disease during pregnancy, and the child was healthy until seven years of age when she died with this disease. Out of 35 cases this disease followed an infectious ailment in 13 cases, viz.: diphtheria 4, scarlet fever 4, measles 1, whooping-cough 2, cholera nostras 1, unknown febrile infection 1. Massalongo reports one case after influenza. Cases of multiple sclerosis after malaria are recorded by Camellis, Boinet, and Salebert. Jordan reports a case under the care of Suckling coming on suddenly a few days after violent shock. Leyden states that cases beginning like an acute myelitis sometimes pass on to sclerosis.

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THE IMPORTANCE OF EARLY TREATMENT IN INSANITY.

BY MOSES J. WHITE, M. D., OF WAUWATOSA.

This subject is one which frequently forms a large portion of the matter contained in the official reports of superintendents of hospitals for the insane throughout the land, as well as a prolific topic for discussion in the meetings of associations devoted to the study of insanity and allied conditions. It is one which, however, is rarely presented for the consideration of a body of general practitioners; and in view of the present tendency toward the cultivation of the study of preventive medicine, prophylaxis as much as the cure of the various ills which beset mankind, I deem it most timely to offer a few suggestions with reference to the all-important need of active treatment and particularly sequestration in the average case of insanity presenting constantly in the experience of the general practitioner, and to urge especially the advisability of early action in these cases.

The tendency on the part of relatives to procrastinate and to defer action looking to the commitment of a case to the hospital for the insane is so well-known as to require no lengthy consideration.

This course is adopted through various motives, in many through ignorance of the danger of delay; in others from prejudice toward the hospital; in others again through fear of disgrace, as they esteem it as a stigma or blot on the family; and again in other cases, I fear through the misdirected advice of the attending physician.

The records of the average insane hospital will fully substantiate the fact of dilatory action in the matter of commitment, in the table of duration of disease before admission, and

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it is assuredly a sad commentary on the lack of wisdom displayed by those interested, or who ought to be, in the future welfare of the afflicted subject.

Insanity is a purely physical disease, and as such amenable, in its incipiency, in many cases at least, to remedies calculated to correct the disorder. Aside from cases of gross brain disease, general paresis, epileptic insanity and brain-syphilis it is, at the outset, essentially a disorder of function on the part of the brain, and in a large number of cases readily responsive to treatment; even the exceptional forms of disease noted are susceptible of improvement by instituting suitable treatment at an early stage. The somatic theory as a basis of insanity, is sufficiently well established to require no extended argument; such being the case the treatment of various derangements of the purely physical system, and that at an early period, is of prime importance.

The longer they are disregarded and the longer treatment looking to a correction of these difficulties is deferred, the more certain is the advent of chronic insanity and dementia, the goal of practically all chronic forms of mental disease.

The analogy between conditions existing in the purely physical system and those occurring in the psychical domain is too close and manifold to necessitate lengthy consideration; the effects of treatment long delayed, in the case of joint-injury is obvious, viz.: anchylosis; in like manner treatment for a disordered brain, long deferred, inevitably results in changes producing a permanent crippling of the mental faculties.

It used to be argued that insanity was, in the majority of cases, due to either of two conditions, vis., excessive or reduced blood-supply to the brain.

Later we came to regard the matter of the quality of the circulating fluid as a factor in its production; I think there is a measure of truth in the observation of the pioneer alienists.

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The conditions producing insanity in the average cases are largely those of anemia or hyperemia, purely circulatory disturbances, and as such, capable to a great degree of being regulated and corrected. Likewise the quality of the blood; the proportion of red corpuscles ought to be considered, and remedies tending to increase them employed. Such being the case, or assumed to be, the importance of instituting measures tending to the correction of these irregularities, quantitative and qualitative, will suggest itself most forcibly to us all.

The pathological changes presenting in a case of insanity, as seen by *post-mortem* examination, are too conclusive, as to the conditions existing primarily, to leave any doubt as to the efficacy of treatment early instituted.

In the case of mania we discover all the signs of overaction, viz., thickening of the dura mater and pia mater; a milky tint of the arachnoid and even an increase in thickness of the calvarium; hypertrophy of the neuroglia, choking of the lymph-spaces and every indication pointing to the existence of excessive blood-supply to the convolutions.

The motor excitation, mental exaltation, rapid flow of ideas, flushed appearance of the face, throbbing carotids, morbidly animated facial expression, brilliant eye, and many other symptoms, all tend to the establishment of the belief in the existence of a disordered cerebral circulation of an hyperemic nature.

The opposite condition, viz., melancholia, presents symptoms pointing to a condition of partial starvation of the brain-tissue; the pallid appearance generally, absence of facial animation, lack-lustre eye, slow mental energizing, feeble pulse, depressed temperature, painful hallucinations and delusions, all mark the lack of nourishment to the cerebral convolutions, and the condition long continued inevitably results in a state of mental apathy and torpor, the precursor of secondary or terminal dementia so certain to supervene.

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This latter condition is accompanied by, and is, undoubtedly, the result of cerebral atrophy, and when it occurs all hope of complete and permanent recovery is lost; the most to be expected is the occurrence of partial recovery, in which state the patient is a mentally maimed individual and remains such during the period of his natural existence.

As stated before, the morbid changes in the brain, found on *post-mortem* examination, pointing to the existence of these states described viz., hyperemia and resulting hypertrophy succeeded by ultimate shrinkage or atrophy, and the conditions of cerebral anemia and resultant atrophy, are so plainly presented to view as to impress one most strongly with the necessity of instituting early and active measures tending to a correction of the existing disorder.

The wisdom of early treatment and particularly of sequestration in the average case of mental disease will not, I think, be questioned when the preceding considerations are held clearly in view.

The many difficulties which attend the treatment in the home of the patient; the active resistance, open defiance, refusal of food and medicine; disinclination to take fresh air and exercise; to obtain sleep in proper amount, and many other difficulties to be contended against, render it practically impossible to accomplish anything in the line of treatment directed to a cure. Valuable time is being wasted and to the end of rendering the case an addition to the already large army of the chronic insane.

Among the wealthy classes and in carefully selected cases, home treatment may be admissible, but even then comparatively few respond to treatment under such conditions.

In the very nature of the disease the first symptom, and the most prominent, is the perversion of the ego; the natural self is alienated, and as a result all the feelings and affections natural to the individual are distorted; the sufferer regards with aversion those nearest and dearest to him and his antip-

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athy toward them eventuates in negativing any results attempted in the way of treatment.

A removal from home and familiar surroundings is the first indication in the treatment, and the beneficent results of such removal are too apparent to those engaged in this line of practice to leave any doubt as to its efficacy.

The theory of autoinfection as an aggravating cause of the perpetuation of the disease has been thoroughly discussed by alienists, and the lessons of experience along these lines have been so convincing as to make it our prime effort to overcome this element of causation as soon as possible.

It is characteristic of the average acute case to present a condition of habitual constipation, and it is one which is exceedingly difficult of correction, by reason of the aversion of the subject to take remedies directed to the condition.

This condition is essentially one of atony of the intestinal tract, and to such a degree that it requires a lengthy course of treatment to correct it. The patient does not respond to the usual remedies, and for a time the only recourse is enemata, both high up and the ordinary rectal enema, together with the occasional washing out of the stomach.

My experience in the employment of the high injection confirms the truth of the theory perfectly; while the patient will have a daily movement of the bowels, and is seemingly regular in that function, the actual condition encountered is one of obstinate constipation which only a persistent course of tonics, such as strychnia, will overcome. This fecal matter is reabsorbed to a greater or less extent and chemical changes ensue which result in poisoning the brain and nervous system.

The state of affairs is one which is extremely apt to be overlooked by those not thoroughly familiar with this class of patients and to the serious detriment of the case. We have frequently had patients brought to the hospital said to be suffering from diarrhea; likewise from retention of urine. The fact proved to be that the patient was suffering from a dis-

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charge occasioned by an overloaded colon or an overdistended bladder. This is a matter of grave importance in the treatment of a case of insanity, and one which is exceedingly apt to be overlooked by the general practitioner, relying largely upon the statements of friends, who as a rule are not qualified in any sense to judge of the actual conditions existing.

Again, the necessity of administering to patients of the acute type, under home treatment, enormous quantities of sedative and soporific remedies constitutes a most serious objection to outside care.

It is in my own experience not a rare occurrence to receive a case, the symptoms of which are completely masked by the narcotic administered just prior to his admission. It becomes necessary to allow the drug to become eliminated from the system before a diagnosis can be intelligently made.

In a paper recently presented by P. M. Wise, president of the Commission in Lunacy in New York State on the subject of "the treatment of insanity, past, present, and prospective," the doctor says, speaking of home treatment for the sufferers from insanity, "The manifestations that call the physician are symptomatic only. Sedation and narcotism is the subduing of fire with oil mixed in the water," further, "the preservation of household quiet has been the death-knell of many a victim, not by intent but by misdirection, and for this reason, almost wholly, is early removal to special facilities for the treatment of the insane desirable."

To give you an adequate idea of the prevailing modes of treatment of the insane in the modern hospitals set apart for them, I cannot do better than to quote further from the paper of Dr. Wise. He says: "The present methods of the treatment of insanity in hospitals are founded upon the removal of active causes—toxines, either auto, artificial, or objective —irritations of the nervous mechanism from all causes, the improvement of the general health and the development of all bodily structure to a normal condition of resistance. No

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means are discouraged, in fact no means are withheld that will attain this result."

The results attained in the treatment of the insane in hospitals, are sometimes adverted to reproachfully on the part of the general practitioner.

It is asserted that the statistics of recoveries are misleading; that the same case is made the subject for several recovery discharges annually, and that on the whole few, if any at all, constitute complete and permanent recoveries.

There might seem to be some basis in fact for these assertions as applied to asylums for insane of former times; I am, however, strongly inclined to question the justice of applying them to the average modern hospital for the insane. The rules of the association, composed of medical superintendents throughout the land, enjoin the discharge, as recovered, of the same patient twice during the same year.

Next, as to the discharge of patients, as fully recovered, who by reason of a relapse subsequently might furnish ground for this assertion; it is the practice of authorities of hospitals for the insane to discharge, as recovered, any case not known to be the subject of periodic or recurrent insanity, so soon as he fails to present any delusions, hallucinations, or any symptoms of insanity, or rather after he has failed to present these symptoms for a reasonable period of time.

It is assumed that the sufferer is in a state of normal mentality, no matter of what grade, high or low, and the alienist is not yet possessed of an infallibility of judgment and foresight which will enable him to predict the recurrence or relapse which we admit frequently occurs in cases sent out as recovered.

He can, however, safely predict to himself, and he does to the patient on his discharge, for his possible benefit, the return of the malady when he goes back to old surroundings which gave rise to the attack, and lapses into careless or

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vicious habits of living, which were primarily productive in causing his disorder.

The statistics of recoveries in hospitals for the insane in this and foreign countries, serve to emphasize the importance of early treatment more than any argument, however lengthy, which can be advanced. These statistics serve to show that of new admissions received within three months of the onset of the disease, 75 per cent. recover; within six months, 50 per cent.; within one year, 25 per cent., and after one year's duration, 10 per cent. These statistics are based upon reports of asylums throughout the world, carefully collected and prepared by men thoroughly versed in such matters, and whose ability in this line is unquestioned.

This brief paper may be most properly concluded by expressing the hope that the efforts made in the direction of promoting the clinical study of insanity in medical schools in recent years may be productive of much future benefit by inculcating in the embryo practitioner the grave importance of advising early removal to the environments of the hospital of cases which may come under his observation.

DISCUSSION.

Dr. Becker: The sequestration of patients alluded to by Dr. White is a very important matter in the early treatment of many cases of insanity. It is quite easily provided for in patients who have means, but the great question is how to give the early treatment in the case of patients without means. This is what the law providing for the voluntary entry of patients into hospitals for the insane, was meant to attain, that is the early voluntary removal of patients from their environment, and as there are several superintendents of hospitals here this afternoon, I should like to ask the question as to the operation of this portion of the new insanity law.

Dr. White said that the cases under treatment as voluntary patients were not very numerous and that there was one

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difficulty, namely, that they had to maintain themselves, and that, by reason of the requirement in the way of pay for maintenance, many deserving patients had to be refused admission under its provisions.

Dr. Lyman spoke to the same effect.

Dr. Becker: From the fact that without the maintenance clause in the voluntary commitment act, any tramp may commit himself at the expense of the state, it was necessary to make some provision for board of these patients. I know it is a most difficult thing to frame a satisfactory voluntary commitment law. At the same time if hospitals for the insane are to deserve the name of *hospitals* and not mere *asylums*, it seems to me that there must be some provision by which patients may enter them voluntarily, as they do other hospitals. By virtue of this law the superintendent is given entire discretion, both as to admission and the length of detention of these patients, so that he may refuse to admit objectionable patients. The patient may be discharged on giving five days notice of his desire to leave. If on requesting his discharge, he is not in a fit condition to be at large, these five days will give time enough to secure his commitment.

Dr. Fuchs said that possibly our law was not constitutional because it did not allow a man to appear in his own defense.

Dr. Becker said that it was a most difficult thing to have a commitment law constitutional and said they had been declared unconstitutional in a number of the states. Our insanity law is not an ideal one from a doctor's standpoint, but it was the best we could have: it was a compromise between the doctors and the lawyers. The lawyers, if they had their way, would have a very rigid court-proceeding to determine commitment; the doctors, if they had their way, would have patients in their hospitals without any judicial process whatever. I can only say that it is easy for people to object broadly on the ground of the unconstitutionality of the law, but I would like to have people who attack the law point out where and how it could be improved.

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PRECOCIOUS CEREBRAL SYPHILIS.

BY W. F. WEGGE, M. D., OF MILWAUKEE.

Professor of Nervous and Mental Diseases, and of Physical Diagnosis, Milwaukee Medical College.

J. M., aged 22 years, a tinner by trade, called at my office on January 14, 1896, to consult me on account of a sore situated on the fore-skin of the penis, which he had first noticed about two weeks previously. He admitted the possibility of a syphilitic infection.

The base of the sore was hard and the inguinal glands of the left side were enlarged, but not tender. No other evidence of syphilis was present at the time.

He next called on me about two weeks later, when he presented a typical macular eruption situated principally upon the abdomen and chest. There was a slight elevation of temperature, and he complained of a rather ill-defined, dull headache.

He was put on antisyphilitic treatment, ($\frac{1}{24}$ gr. of bichlorid of mercury three times a day) at once, and in the course of about two weeks the eruption disappeared.

Although the patient was instructed to cleanse his mouth thoroughly with a solution of potassium cholorate each day, he developed a very severe mercurial stomatitis in the course of ten days after the beginning of the treatment, which made it necessary to interrupt the treatment.

The patient was kept under observation and treatment for his stomatitis for some time, and finally failed to report.

About eight weeks after the beginning of the treatment, or about twelve weeks after the appearance of the chancre, he called again at the office, and made the following report: He had recovered from the stomatitis, and had been feeling pretty well until four days ago, when he noticed that

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objects appeared blurred to him, so that it became impossible to do his work properly. He left the place where he was employed to go to his boarding place. On the way he experienced considerable nausea, was dizzy and after his arrival at his destination vomited some. He went to bed, and remained there until he came up to the office. At the office he complained of a dull headache, a sensation of dizziness, diplopia and nausea.

On examination there was found a slight ptosis of the left upper lid, and a weakness of the internal rectus of the left eye. His pulse was 64. His temperature was not taken.

With a knowledge of the patient's previous history, antisyphilitic treatment (this time in the form of mercurial inunctions, one dram of the 35 per cent. ointment each day) was resumed at once. In a little over a week all of the symptoms had disappeared, and there has been no return of the trouble since.

Cerebral syphilis is by no means a rare disease, as every one who has followed the study and treatment of nervous diseases for any length of time, has abundant opportunity to observe.

The great importance of the subject has lead many investigators to choose this field, and as a result, its literature has become quite voluminous.

As a direct result of these investigations, many have found it impossible to longer adhere to the classification of syphilis (established by Ricord) into three stages, *i. e.*, the primary, the secondary, and the tertiary, excepting as a matter of convenience in didactic instruction.

According to Ricord the changes occurring in the brain, its blood-vessels and its membranes as a result of syphilitic disease, occur during the tertiary stage.

The discovery that these changes may occur during the secondary stage, and according to some authorities, even during the continuance of the primary symptoms, has led to

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an investigation into the changes occurring in other organs of the body during the early stages of syphilis; and, also, has led to a change in the views held in relation to the occurrence of three distinct stages in this disease.

The symptoms of cerebral syphilis put in their appearance most frequently between one and ten years after the primary infection; but have, in some cases, developed after eighteen to twenty, and even thirty years.

The reported cases in which they have developed very shortly after the beginning of the syphilis, are as yet not very numerous, but they are sufficiently authentic to preclude any doubt as to the correctness of the diagnoses.

Schmit has reported a case in which hemiplegia developed six months after infection. The case proved fatal from a second hemiplegia which occurred three months later. On *post-mortem* examination there was found extensive syphilitic endarteritis of the cerebral arteries.

Brasch reported a case in which the first symptoms (a facial paralysis) occurred within a month after the infection. He expresses some doubts as to the syphilitic nature of this paralysis. However, within three and one-half months there developed tremor, vertigo, and loss of patellar reflexes. The case terminated fatally, with symptoms of bulbar paralysis within fifteen months.

Death was found to have been due to vascular disease—endarteritis syphilitica—resulting in numerous patches of softening of brain-tissue.

Jolly found the same condition in a case that died twenty-six months after infection.

Baumgarten has shown that syphilitic diseases of the arteries occur during the early stages, and consist primarily of a proliferation of the endothelial cells.

Owing to the fact that a large proportion of the cases of early syphilis of the brain recover, the reports of cases with-

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out a fatal termination are much more numerous than those in which the postive *post-mortem* proof could be submitted.

Among those who have been particularly active in establishing the fact that early syphilis of the brain does occur are: Naunvn, Heubner, Rumpf, Gowers, Althaus, Hutchinson, and Gajkiewicz.

Norbury has described a case occurring during the continance of primary symptoms. The symptoms given are: nearly healed chancre, general enlargement of glands, mucous patches in the mouth, and a pustular inflammation on the forehead.

The cerebral symptoms were: insomnia, headache, followed by somnolence, and later, by a somnambulistic state.

The patient had contracted syphilis three months previously. He was under treatment for syphilis and had been for some time.

Fournier and Kowalewsky have reported a number of cases of early syphilitic epilepsies, occurring during the secondary stage.

The causes of the early development of cerebral syphilis are quite uncertain. Althaus considers youthful age, hereditary tendency, injuries to the head, psychic traumata, sexual and alcoholic excesses as predisposing particularly to early development of syphilis of the central nervous system.

Brasch believes that insufficient treatment tended to lead to the same result in his case.

In my case the youthful age and the necessary interruption of the treatment may have had something to do with the early appearance of cerebral symptoms. Of the other predisposing causes mentioned none were present.

Lewin has called attention to the fact that mercury frequently causes cerebral symptoms, such as vertigo, syncope, etc., no matter in what form or manner it may be used, and intimates that at least some of the cases supposed to be cases

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of early cerebral syphilis, may simply be cases in which mercury has produced this peculiar effect.

I believe that in this case mercury certainly has had nothing to do with producing the symptoms because none had been used for about six weeks prior to the onset of the symptoms, and because the symptoms disappeared promptly after the use of mercury was resumed. Again, the presence of ptosis and of diplopia would lead me to believe that changes of an organic nature must have occurred somewhere in the course of the left occulo-motor nerve.

The cases of early cerebral syphilis in which it was possible to make a *post-mortem* diagnosis have presented changes in the blood-vessels of the brain chiefly, together with changes of nutrition necessarily resulting therefrom. Gummatous infiltration of the coverings of the brain have been comparatively slight.

From this it might be assumed that arterial disease is the rule in early cerebral syphilis. I do not believe that this necessarily follows.

The prognosis of syphilis of the arteries is notoriously bad, many cases defying all specific treatment; that of gummatous infiltration is relatively good; proper treatment usually being followed by absorption. As a result the latter cases rarely present an opportunity for *post-mortem* examination.

The character of the symptoms together with the promptness with which recovery took place in my case, would lead me to believe that the diseased process was one of gummatous infiltration of the meninges.

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EVOLUTION OF PERSECUTORY IDEAS.

BY W. F. BECKER, M. D., OF MILWAUKEE.

As a fog gathered about the ship removes it from its true adjustment to its surroundings, so from the standpoint of morbid psychology we may fancy the mind as surrounded by an obstructing medium, a nebula, so to speak, which removes it from truest relation and reaction to its environment—the "glass" through which we see "darkly." Were it not so, were all the actions and reactions of the mind perfectly adapted, there could be such a thing as absolute sanity. So long, however, as evolution with its necessary readaptations and the processes of dissolution with their tentative adaptations continue, so long can there be but imperfect, groping relations to surroundings, more or less defective, and morbid mental action and sanity and insanity but relative terms. Many symptoms appearing in the insane, therefore, have their analogue in the morbid mental manifestations of the sane, and it may be an *a priori* conclusion that they have a common genesis, and should be identified for purposes of study. Such identification may, for example, be made between the delusions of persecution among the insane, and the "sense of injury" among the sane.

By this "sense of injury" is meant that vague sense which afflicts many of us at times, of being the object of hostile feelings on the part of others. Indeed, it is a feeling which most of us experience in different degrees at times. No doubt it is often enough well-founded, for in the stress of necessary rivalry and conflict upon which progress depends, we both wittingly and unwittingly injure one another. But there remains a large excess of this "injured" feeling which cannot be so explained, or which is disproportionate to its cause, or

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entirely gratuitous, and is thus shifted into the field of morbid psychology. It is of this only which is here treated—the "sense of injury" without foundation.

It is certainly one of the commonest forms of morbid mental action. From a feeling of being the object merely of a stinted sympathy or a vague sense of abuse, to the entertainment of serious grievances or persecutory ideas, it finds a swift and easy entrance to the mind.

In certain temperaments it is much in evidence. On so-called "blue" days for instance, we are constantly moved to a "sense of injury" from fancied slights or aloofness of our friends. How the jaundiced imagination translates their innocent conduct into all shades of ill-will, is a too familiar example to many of us.

Suspicious people are loaded with this "sense of injury." They entertain a chronic state of mind by which the acts of others are given an invidious construction. They seem to anticipate ill-will, carrying the "chip upon the shoulder." In a situation with two possible constructions they leap to the more offending. Many of them come to bear the outward marks—the stigmata of this mental state—a searching eye, a restless manner, ever alert for a slight or a double meaning; some even acquiring the "asylum" face like that of the insanely suspicious Rousseau. We all know such faces with their hard-set expression, as if they were forever sealed against any tender of good-will. Inviting ill-will, these persons are apt sometimes to get it, for society based on a reciprocity of faith has no smiles to bestow upon the misanthrope. "Laugh and the world laughs with you." It so comes to pass that many of these suspicious persons acquire some real ground for their "sense of injury," and, in the long run, that real quarrels are precipitated from this atmosphere of suspiciousness.[1] Some of this class take the vindictive attitude as a

[1] Indeed this is the psychology of most quarrels. *The effect* of imaginary grievances comes in turn to be the *cause* of real ones.

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result of their "sense of injury," approaching the paranoiac type of insanity, others are humiliated as a consequence, approaching the melancholic type of insanity; each illustrating again how the sane and insane states are paralleled. Notwithstanding the conspicuous ability and character of many of these persons, their misanthropy and social isolation growing out of this state of mind, render many of them practically borderland cases of insanity, and so they pass through life.

Irritable people furnish us instances where this morbid "sense of injury" is coupled with resentment. Easily interpreting anything disagreeable to them as an affront by another, their first impulse is to resent it, which they do more or less violently according to their controlling power, their cooler thought often recognizing the irrational nature of the outbreak. This suggests the feral instinct. Examples, too, are common in the lower animals, while in pain attacking those about them as if they were the cause of it. No doubt this resentment is a survival from evolutionary ancestry. It has probably served a necessary purpose in the conservation of animal life by causing the animal to attack, what may, in the jealousy of self-preservation and its feeble discrimination, even be suspected of being inimical to its welfare. An expression thus of the instinct of self-preservation to the end that the species be maintained. Blind and unjust maybe individually, but nature "so careful of the type, so careless of the single life," hesitates at no apparent injustice to accomplish this. When we go higher to the tribal relation of man we find the same blind resentment. The Australian aborigines have no conception of death except as vaguely associated with homicidal causes, and when a member of a tribe dies, even a *natural* death, a member of a hostile tribe is killed to avenge the supposed murder. And the Africans, too, read homicidal forces into natural deaths. In civilized

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social relations it appears again in the very popular and usually irrational demand for a scapegoat when matters go wrong. The idea of religious sacrifice too, is nothing but a practice by which the anthropomorphic God is credited with being aggrieved by human conduct and of wishing to be appeased therefor. Though the exercise of this indiscriminate resentment was probably greater and more necessary in the presocial stage of human evolution, there is still reason for its exhibition to-day in the struggle for existence which has but changed its arena of activity. Under a veneer of amity, laudable enough, there is still the suspicion and resentment of the tribal relation as we may often see exemplified in a possé of boys, and that this resentment is yet of the blind kind we still have proof, if we have seen an enlightened man deliberately kick a harmless chair because he stumbled on it in the dark.

What, may we ask, is the psychology of this "sense of injury?" In the answer it is difficult to avoid some confusion of mind and brain terms.

Phylogenetically we have already seen it to be reversional, a return to primitive mental states where it played an important rôle in the conservation of the species, its appearance now being but its activity in excess of the requirements. We find it thus in harmony with the atavic theory of insanity. In the individual this sense of injury is a delusion, and, like other sensorial delusions, an attempt by the reason to explain a disordered feeling, in this case a *painful* feeling having its origin broadly in some imperfect adaptation of the organism to be specified later. This attempt to explain a feeling or sensation seems a human necessity. However wide of the truth such explanations usually are, we seem forced to attempt them. In the case of this *painful* feeling with which we are here concerned, we are either unwilling or unable to explain it in its true way and are prone to attribute it to malevolent agencies often personal. Such explanation is often an easy

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escape from truths unwelcome to our ego, truths which, if recognized, would wound pride or conscience beyond easy endurance. It requires a man of rare courage and mental clarity to recognize his particular pain from failure in adaptation as autogenetic, and to lay it to natural and unflattering causes. We prefer of the two to accuse the environment rather than the organism for any failure in adaptation, especially when the organism happens to be our own. We take refuge in a grievance rather than impugn the supremacy of our ego. Indeed it seems to be necessary for healthy subjective activity, so to speak, that a sort of *imperialism* of the ego, however circumscribed, be maintained. It is the condition *sine qua non* of the necessary well-being of the individual. It is most reluctantly relinquished and we constantly see the plainest truths immolated that it be retained. Only in the great self-effacement of melancholia and in those rare characters who recognize and bear complacently naked truths—the "Weltschmerz" of Goethe—is this well-being renounced. Even these who are willing to father their own wounded ego still seek the necessary approbation by reducing its future pretensions that they may not be again pained by their failure to achieve them. They unhitch their wagon from the star.[2]

As to the nature of this pained feeling which evokes the "sense of injury." It is such as affects (a) the relation of the organism to its surroundings (the external nerve-circulation) and (b) the relation of the organism to itself (the internal nerve-circulation—the cenesthesis). Maladaptation of the

[2] Prof. James has illustrated this by a fraction which shows that our approbation is determined by our success, divided by our pretensions. Thus:

$$\frac{\text{success}}{\text{pretensions}} = \text{self-esteem, (approbation).}$$

The quotient approbation may be increased by diminishing the pretensions (denominator) as well as by increasing the success (numerator). James' Psychology, Vol. 1, p. 310. James' fraction is as applicable to the moral as to the intellectual side.

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organism to its particular environment has been mentioned, and broadly includes all minor defaults which contribute to disappointment or failure in the physical, mental, or moral relations of the individual. But the larger factor probably lies in the relation of the organism to itself and is that with which we are here chiefly concerned. Here the disorder is in the sense of self, the conscious personality—the cenesthesis. Physically the cenesthesis is made up in large measure by the sum of the nutritive states of body-cells as conveyed to the brain by the nerve-circulation and there integrated. There are two kinds of nerve-circulation, one external, conveying impressions from and to the outer world, giving us the consciousness of the world at large, the other internal, conveying impressions from and to the body-cells, giving us the consciousness of self, the personality—the objective ego. Any disorder of this internal circulation of nerve-force, whether central or peripheral, produces a change in this sense of self which the individual recognizes chiefly as a change in the feeling of well- or ill-being. Thus when these currents (coming chiefly from the viscera) are in a high state of tension, coincident with a high degree of nutritive activity of the cells from which they come, the sense of well-being is enhanced. When conversely the nerve-currents are feeble, coming from a lesser or disordered nutritive activity of the cells, the sense of well-being is correspondingly diminished, and the atmosphere is present in which the "sense of injury" easily floats.

The physical equivalents of these feelings are to be found in dynamic and toxic conditions of the nervous system and their correlation. We are all more or less familiar with the fluctuations of well-being that take place in the normal organism. By virtue of the law of the rythm of motion there are mental undulations of comparative well- and ill-being which shadow nutritional ones. In the hours approaching noon the tide of nervous energy rises to its highest and with it our

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spirits are lifted up. In the small hours of the night, on the other hand, the ebb-tide of well-being is reached. If we happen to be awake, the most lugubrious thoughts often possess us, a depression out of all proportion to events as they seem to us by day. Specters of fear unwarranted stalk from dark chambers of the mind and like Poe we "dwell alone in a world of moan." The condition is so closely allied to simple melancholia that were it not again lifted by the rising tide of well-being, we would be in a fair way for treatment by the alienist. Herbert Spencer's explanation of the feeling of ill-being is substantially that the painful nerve-channels are deep, while the pleasurable ones are shallow, and that at low pressure of the nerve-circulation the deeper ones being more easily filled than the shallow ones, the painful feelings predominate. For pleasure the stronger currents seem to be necessary.

The toxic conditions are numerous and in the broadest sense involve many departures from the healthy state. They may act on the brain-cells directly, or on the body-cells by depraving their nutrition and diminishing their healthy representation, so to speak, in the sense of self. Hodge has well shown the effect on the nerve-cell in fatigue[3] and old age[4] (conditions in which the sense of injury is much in evidence) in the shrinking of the nucleus and cell-body and the vacuolation and pigmentation of the latter. Similar changes may be inferred as taking place as the result of other causes. The effects on the cell of diseased states are still obscure and have recently had much illumination[5]. Many, especially such as accompany the functional psychoses, for want of *post-mortem* data are not easily ascertainable. They may be temporary, the cell returning to its normal condition (cytolysis), or permanent with more or less cell-destruction (cytoclasis).

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[3] *Journal of Morphology*, 1892.

[4] *Journal of Physiology*, 1894.

[5] Van Gieson's address before the Neurological Society of Baltimore, on the "Toxic basis of neural disease." *State Hospital's Bulletin*, N. Y., 1898.

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Certain states of the organism and its environment may be mentioned which exhibit the "sense of injury" in special relief. As just stated, in old age, where there is a progressive paucity of nutritive activity of the cells, the "sense of injury" is particularly rife. Also in fatigue and exhausted states, which are but old age that is temporary. Here it is present in all degrees. It has been observed that in starving camps there develop delusions of persecution. Neurasthenic insanity is only an expression in greater degree of the morbid mental action found in fatigue and exhausted states.

The primary and secondary effects of alcohol is another soil in which the "sense of injury" easily grows. The habitué is notoriously suspicious, irritable and full of fictitious grievances or unwarranted persecutory ideas. His attitude toward them is that of the paranoiac, vindictive, rather than that of the melancholiac, humiliated. There is, perhaps, no class of persons who so puzzle the psychiater, whose conduct is so alternately interpretable as vicious or insane, and who so swell the ranks of that army conveniently called "borderlanders."

In bodily illness, acute and chronic, the morbid sense of injury is also much in play. An intelligent patient on recovery from a stomach disorder, admitted that whenever her stomach has ached, she was taken with a violent and unaccountable hatred of her companion, with whom she was in affectionate relation. An ignorant southern colored woman who had rheumatism in her ankle, believed she had been "hoodooed," and explained the pain by the belief that a snake had been put into her ankle by a "hoodoo." This patient was not insane, the idea being consistent with her degree of intelligence, training, and early environment. Another patient, a sensible, cultivated woman, while suffering from an illness in which she had received all the consideration that love and money could furnish, believed herself to have been constantly and deliberately abused. After her recovery now some years, she still maintains the belief. Instances could

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be multiplied, for doctors continually meet this atmosphere in the sick-room, from ugly little grievances to delusions of persecution. Doctor Johnson had plenty of ground for saying that a sick man is a rascal, though the modern doctor has reversed the formula.

Persons who suffer from actual trouble or ill-treatment easily develop a morbid sense of injury, just as in the same way under certain conditions they become insane. They cannot easily estimate the precise amount of their real grievance, and there is an easy mental overflow into the fictitious ones. It is for this reason that the narrative of a real trouble or quarrel, is usually so fraught with calumnious arraignment of others, that it is unreliable until we have heard the "other side of the story," and that when disputants meet and explanations follow, they often find that they have no *casus belli*. In the examination of the alleged insane for commitment for instance, there is often the greatest difficulty in separating the actual troubles from the imaginary ones. An application was recently made for commitment to the insane hospital of Mr. F. He was suffering from heart-disease, and thereby compelled to remain home idle. His wife was supporting the family by keeping boarders, and he began to develop a morbid jealousy of her. He annoyed her by his constant watching and intense suspicion of her every act, which amounted at times to the delusion that she was unfaithful to him, and which one night led to an outbreak of violence in which the police figured. On examination it was difficult to separate his real from his imaginary grievance, for his wife had ceased to have any affection for him, though his delusion in regard to her unfaithfulness was unfounded, and had been grafted upon his real trouble. Sent to a general hospital he improved and was reported "not insane."

If we turn briefly to the insane, we find the "sense of injury" as manifested by persecutory ideas, one of the commonest delusions. Their exact character is determined or

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contributed to by disordered sense-impressions, chiefly visceral, the dominance of certain of these impressions over others, by the particular environment of the patient, and by the vestiges of outgrown beliefs. Thus, we find ideas of being defrauded, or conspired against, being acted upon by witchcraft, magnetism, electricity, being poisoned, preached against, called names, subjected to disagreeable odors, and others which are vague and ill-defined. Many of these are capable of being traced to their underlying sense-disorder. These delusions are found in the depressed states of melancholia, as well as in the exalted states of paranoia and mania. In melancholia they accompany a feeling of worthlessness, which is the patient's explanation of the reason why he is persecuted. In paranoia the patient believes the persecution to be prompted by fear or envy of him, and there is consequently a feeling of self-importance—a morbid egotism which is in direct proportion to the magnitude or complexity of the ideas of persecution. Indeed, it is probable that it is these ideas of persecution, acting on a potentially melancholic or potentially paranoiac mind whatever these may be, which determine the type that these respective mental diseases take.

When we compare the injured sense among the sane and insane we find, as in other morbid conditions common to both states, that the chief difference is one of degree. That the mental and physical state underlying the "sense of injury" in insanity is an exaggeration of that in health. The repetition of the morbid impression, whether aroused wholly from within or only in part, contributes to its final organization, so to speak. As a writer on the etiology of insanity has put it: "Untoward circumstances requiring a hard struggle for livelihood, disappointments without apparent cause, a certain disposition to sentimentality, some narrowness of mind, unite in preventing a right estimation of the wrongs suffered, and the proper relations of undoubted misfortunes. And should the evil combination continue, general mental enfeeblement

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ensues, and in the end the patient becomes completely unable to correct false reasoning." We find, also, that the injured sense is less *fixed* in the sane, that it is ephemeral and more easily explained away, depending upon fugacious brain-states. Also that it is less systemized in the sane than in the insane, although instances of the most elaborate systematization are sometimes met with, especially where the element of some external foundation is large. It is probable, however, that the elements of fixity and elaboration of the persecutory idea are after all dependent upon and in proportion to the intensity of the brain- and mind-states underlying it. In other words, that to increase a given intensity of these states is to increase the fixity and elaboration of the "sense of injury" until finally exploited in conduct, which is the *debut* of the insanity.

In conclusion there may be emphasized what has all along been maintained—the relativity of insanity. It has been plain on the line here pursued. It would be equally so in following other lines of morbid psychology. Not that it is in dispute, however, but that it is not sufficiently realized. Even writers still treat insanity too much as an entity apart from its bearing on the average mind, and its evolutional history. Nature or science, however, has set no line between the morbid mental manifestation that constitutes sanity, and that which constitutes insanity, that being an abitrary, however practical distinction which science has had rather to descend to meet.

DISCUSSION.

Dr. Fuchs: Dr. Becker probably means that these ideas are atavistic in a limited sense, not absolutely so. For instance, club-foot is an atavistic phenomenon; it is a reversion to the type of walking of our pithecoid ancestors. Of course the structural change in the bones is understood to be an after-effect from use of the foot. This may be taken as an

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absolutely atavistic phenomenon, that is, a reversion to the type out of which man had his origin. Now these ideas of demons, spirits, etc., certainly did not originate in the animal, at least we cannot follow them back so far. For all practical purposes they had their origin in man as man, in the thinking animal; they were acquired. Therefore, persons who hold to such views, or who present such traits, demonstrate the origin, the evolution of these persecutory ideas.

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CATGUT IN ABDOMINAL SURGERY.

BY E. COPELAND, M. D., OF MILWAUKEE.

My object in bringing this subject before you at this meeting, is to give my personal experience in the use of catgut as a material for sutures and ligatures. Each individual's experience may add some new truth to our knowledge of a subject. I have used catgut in general gynecological work for the last twelve years, and exclusively in all abdominal work for the last three years. I think that it meets all the requirements of an ideal suture and ligature. It has pliability, strength, sufficient endurance, can be rendered practically sterile, and, unlike nearly all other sutures and ligatures, is quickly absorbed after performing its work. It is preferable to any other animal suture or ligature for the following reasons: it can be procured in any size desired; is easily rendered aseptic; and on account of its cheapness. Do not use catgut unless you are sure you can do aseptic work, and are willing to give your personal attention to its preparation. In ordering catgut Dr. R. T. Morris has suggested that you order by the American Standard Wire Gauge; in this way your catgut will always be uniform in size.

HOW TO RENDER CATGUT ASEPTIC.

Various methods have been proposed and tried to accomplish this end: juniper oil, chromic acid, corrosive sublimate, alcohol, cumol, formalin, dry heat, boiling in olive oil, etc. I shall not attempt a detailed account of the various methods, as they can be found in recent text-books and medical journals.

The method that I have always employed is the only one that I shall mention—boiling the catgut in alcohol. I had em-

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ployed this in a crude way for some time with a waste of much alcohol by evaporation, until I saw an article in *The Medical Record* of December 3, 1892, by Charles N. Dowd, in which he gives a description of a condenser to prevent the evaporation of the alcohol.

This condenser is made by encasing a coil of block-tin tubing in a cylinder of sheet copper. Two taps are inserted into the cylinder for the transmission of water in and out. The lower one is attached to faucet of running water, and the upper one is fitted with a rubber-tube to provide for the escape of the water. The crude catgut as received from the dealer, is wound on glass spools and put into absolute alcohol in such an open-mouthed jar or bottle as is convenient. The piece of block-tin tubing at the bottom of the condenser is fitted into a perforation in the cork of this bottle or jar. The jar is then placed in a water-bath and boiled for one hour.

This device is simply a still which recondenses the alcohol.

Alcohol alone has great germicidal power. Catgut boiled in absolute alcohol for one hour is, I believe, rendered sterile and increased in strength. Repeated boiling does not weaken the gut. My belief is based upon twelve years' experience with catgut, prepared after this method, without a single bad result that could possibly be attributed to the catgut. Some objection is made to the time and trouble required to prepare catgut after this method; no method could be quicker nor easier after you have your apparatus; no more than five minutes is required to have your catgut boiling.

The catgut used at Johns Hopkins was prepared after this method until they had three consecutive deaths from sepsis, which they attributed to the catgut, although no bacteriological test of the catgut used was made. In reviewing the report of these cases, as recorded in the Johns Hopkins bulletins, it must have been by the process of exclusion that they arrived at their conclusions; the catgut was apparently made a scapegoat for the bad results.

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TREATMENT OF THE PEDICLE WITH CATGUT.

There are two methods of treating the pedicle: *First*, ligating *en masse; second*, ligating each vessel separately. The common method, and the one I have usually employed is to ligate *en masse*, using the Staffordshire knot, reinforcing this by carrying the ends of the same ligature around the pedicle just back of the primary ligature. I always take this precaution in placing a ligature within the abdominal cavity as there is a tendency for the catgut to untie. The only objection to this method is that adhesions sometimes take place at the end of the stump. To obviate this a second method has been suggested, that is, ligating each vessel separately and stitching the peritoneum over the end of the stump. This requires considerable more time than does the first method, and time enough has not yet elapsed since this procedure has been restorted to, to prove that adhesions will not take place. My opinion is that nothing yet devised will prevent adhesions taking place in a certain proportion of cases.

VENTRO-FIXATION OF THE UTERUS.

All cases of ventro-fixation of the uterus have been done with catgut; about No. 6 gut is used for this purpose. The fixation-sutures are not carried through the skin, but are passed through the muscle and peritoneum at the lowest angle of the wound, then through the fundus of the uterus and out through the peritoneum and muscle on the opposite side, then tied and left as a buried suture. When the uterus and ovaries are normal and uncongested, or when the ovaries and tubes are removed, one suture, only, is used; but when the uterus is large and congested, as is often the case when it has been retroverted for some time, two sutures are inserted. I have watched carefully the cases where the ovaries and tubes were not removed, as it is in such cases we are most apt to meet failure, and have yet to find a case where the uterus was not retained in position.

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CLOSURE OF THE ABDOMINAL INCISION.

In closing the abdominal wound the object to be obtained is exact coaptation of the parts. The peritoneum is brought into apposition with a running suture of small size (No. 0) and the aponeuroses and muscle are brought together after the following method: the first stitch is placed so as to bring the aponeuroses together; the next stitch includes both the aponeuroses and muscle; the stitch including the muscle is carried clear down to the peritoneum, each alternate stitch including only the aponeuroses; in this way you get perfect coaptation of the parts. The third continuous suture includes the layer of fat and skin; for this purpose we use a fine suture (No. 1), which experience has taught us answers all the purposes that a larger one does. This is placed as was the one in the muscle and aponeuroses. The first stitch includes the skin only, the second one, skin and fatty layer down to the aponeuroses, each alternate stitch including skin only, making perfect coaptation of the skin. Since using this method I have never failed to get perfect union. In my early work with catgut I did not use proper precaution in bringing the fatty layer together, and sometimes had oozing of a bloody serum from between the stitches. This was obviated by pursuing the above method. A wound that is not healed in from six to eight days, is not going to heal by immediate union. The fine catgut used to bring the cutaneous surfaces together will last from eight to twelve days.

There is a good deal of skepticism among many operators as to the reliability of catgut as a suture for the aponeuroses and muscle, and other surgeons who use catgut for this purpose use silk-worm gut for the layer of fat and skin. My experience is that such skepticism is not valid, and that catgut meets every indication. The method at Johns Hopkins of using buried sutures of silver wire to close the aponeuroses is, to my mind, a step backward in surgery. Dr. Morris says that silk-worm gut is an instrument of the devil when used for buried sutures.

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ADVANTAGES OF CATGUT.

The one great advantage of catgut is that it is absorbable and does not remain as a focus for subsequent infection. Tait, in speaking of his treatment of the broad ligament pedicle with silk ligatures, says: "Another accident which tells against the ligature is the occurrence of a number of cases, three or four per cent., in which the garroted stump and ligature get the better of the living tissue around them, prevent the tissues absorbing them, causing suppuration, and forming sinuses which do not heal but go on discharging until the knot of thread is got rid of, months, it may be years, after the original operation. Sometimes the ligatures burrow into the sinuses of the broad ligament and are discharged into the rectum or bladder." The same charge has been brought against silk-worm gut and silver wire when used as a buried suture, "when they fail to become encysted they may come out months and years after in strange places." The patient is also saved the annoyance of having the sutures removed. The remote results, I am positive, are better than when a non-absorbable ligature or suture is used.

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THE IMMEDIATE REPAIR OF THE PERINEUM.

BY G. V. MEARS, M. D., OF FOND DU LAC.

A torn perineum is an accident not relished by any physician. It has, however, been happening possibly since Eve's first accouchment, and the chances are, will continue to happen for some time to come.

For a long time, and even now to a certain extent, it was attributed to a lack of skill on the part of the accoucheur. The reason for thus always holding the attendant accountable, was due no doubt to the fact that a very small percentage of the tears was discovered by the attending physician or became known to the laity. Frequently the unfortunate doctor was censured in all honesty by his fellow-practitioners, who were themselves having their full quota of accidents without knowing it.

Then, too, the attendant discharged his responsibilities when the child and secundines were delivered and the patient safe from all danger of hemorrhage. Times have changed; our responsibilities have increased; and our whole duty is not done until we have sought diligently for all accidents that may have happened, and carefully repaired them. We believe that the number of practitioners who discharge their whole obligation in these cases is increasing, but we still find a few men who, either from carelessness or dishonesty, claim immunity from this accident. I was told once by a man who had a large obstetric practice, that he had never had a torn perineum in his practice, while the facts were that nearly every primipara delivered by him had been torn. These accidents do happen under the most skillful treatment, and the claim of a physician that they never happen with him is an admis-

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sion that he does little obstetric work or makes only a superficial examination after delivery.

The more intelligent laity understand that the accident will sometimes occur and are grateful for its prompt repair; not so among the ignorant, and an innuendo from a physician who is not over-honest will work an injustice to the honest man. It still requires courage for a young man to tell a woman she is torn and that the tear must be repaired, for his professional reputation is likely to suffer at the hands of a more experienced but more careless practitioner.

If every one would make a careful ocular examination of each perineum and vagina after delivery, the profession would be surprised at the number of tears found, and the pot would cease to call the kettle black.

It will not do for the physician to flatter himself that a tear will heal without suturing and no one be the wiser. No suturing, no union, is the invariable rule. Neither will it do to consider a tear trifling because it does not extend far down the perineum externally, for the rent in the vagina may be extensive.

The tear usually passes through the perineum, veers to one side or the other and passes up one or both vaginal sulci to a greater or less extent, the body of the perineum being partially torn from the rectum.

The question of the healing of the perineal body is settled beyond discussion. There will be no more failures than in the secondary operation unless infection or some constitutional disturbance exists, under which circumstances we would not be justified in operating.

Of fifteen cases operated upon in the last ten years, I have had no complete failure, though some were far from ideal.

The objection of many gynecologists to immediate repair is, that results in the hands of the general practitioner are not satisfactory. This objection could be urged with justice

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in some of my first cases, for I used, as taught, the Emmet method of passing the sutures, and paid no attention to the vaginal rents; and it was impossible with this suturing to bring the vaginal edges of the tear in close apposition and into the same relative positions they occupied before the accident.

We need not hesitate to operate because of the surroundings, or the lack of an efficient nurse. It is the immediate field of operation, fingers, instruments, and sutures, not the side-walls and ceiling, that are factors in the healing process. While a good nurse is very desirable, I have had but two trained nurses in my few cases, and once the husband constituted the sole nurse.

The reasons for the immediate operation are so obvious that I will merely mention them. The parts that are torn assunder can be better approximated at this time than in the future. It lessens the chance of infection; it shortens convalescence, and prevents the bad effects that follow non-repairment; and the patient is not subjected to the dread of a future operation, with its loss of time and increased expense.

If the accident happens at night, or too late in the day to repair it while a good light is to be had, wait until the next morning. It is best to do the operation as soon as all danger of hemorrhage is past, but the advantage of a good light outweighs all other considerations. You cannot so place the stitches as to secure accurate coaptation of parts torn without a good light. I have done the operation three times by lamp-light, and each time it was not well done.

In one case of complete tear, I was called in on the evening of the second day and operated by lamp-light. I secured only a partial union, having a recto-vaginal fistula remain, the result of a misplaced suture. The parts will heal very readily after waiting twelve or fifteen hours, and at times you will get good union when done on the second day; this delay is not, however, advisable.

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After the second day the operation should be delayed three or four months.

The irregular surfaces to be brought together make the suturing difficult to describe.

There is not the same opportunity for crazy-quilt work in the primary as in the secondary operation, and yet there are various methods of suturing employed. Whatever the mode, every part of the rent must be actually brought together in its normal position, especially the vaginal part.

When ready for operating, the patient must be brought to the edge of the bed or table in a good light, the legs held by a good leg-holder, the parts shaved and cleansed, the vagina irrigated with warm, carbolized water, and a plug of cotton inserted in the vagina to keep back the flow of blood.

The wound must be trimmed of all tissues that will prevent healing, and the margins to be brought together trimmed, if necessary. All rents in the vagina must first be closed with catgut. The one communicating with the perineal tear must be closed by deep sutures, nearly to the lower angle, leaving the lower part of the vaginal tear free, so that it can be brought downward and forward to its normal position, the last suture at C. D.

The suture material for the body must be silk-worm gut, and the manner of placing it I learned from Kelly. It is the one usually employed in secondary operations.

Beginning near the lower angle on the left side of the patient, pass the needle deeply upward and outward, emerging at the edge of the rent in the vagina a short distance from its juncture with the left vaginal sulcus, from A to B. The needle is then entered at the edge of the rent in the recto-vaginal septum, and passed out at the opposite side from C to D. The needle is then passed from the right side from within out, taking a similar course to that in the left side. One or more sutures may have to be passed. When the su-

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tures are tied, accurate coaptation of the sides of the perineal body is secured.

The recto-vaginal septum is brought downward and forward to its original place, making the perineal body strong, and restoring the normal course to the posterior vaginal wall.

In complete tears, the torn rectum is first sutured, and the remainder of the stitches passed as above. There is no suture that does its work as well as this, especially in complete tears.

The urine should be drawn at the close of the operation, and might be done for twenty-four hours more, though I do not hesitate to let them void urine from the first. Never draw it after twenty-four hours unless necessary.

The vagina should be douched with warm, sterilized water, two or three times in twenty-four hours.

The bowels should be kept soluble with sulphate of magnesia after the second or third day, and in complete tears the bowels should be moved by the fourth day.

The patient may have all the liberty in bed she wants, except sitting up. Bandaging the legs is a useless measure.

The sutures should be removed from the tenth to the fourteenth day, and the patient allowed to sit up one week later.

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FIBRO-MYOMATA OF THE UTERUS.

BY CHAS. W. OVIATT, M. D., OF OSHKOSH.

The object of this paper is to study the indications for surgical interference, and to discuss the relative merits of the various surgical methods resorted to in dealing with the so-called fibroid tumors of the uterus.

I shall not touch upon diagnosis, medical treatment, or the use of electricity, and it will be unnecessary to go into pathological detail farther than to illustrate the manner in which these neoplasms develop.

The multiplicity of forms which characterizes these growths is due largely to the situation of the primary tumor-matrix in the uterus, and to the resistance met with in the process of its development. They are most frequently multiple, the individual tumors exhibiting a tendency to pedunculation and independent growth. If we accept Cohnheim's hypothesis of tumor-formation, we must believe that the uterus is often the seat of a large number of embryonic matrices. They vary as greatly in consistence as they do in form. Their histological construction shows that they are composed of cells derived from the myoblasts and the fibroblasts. The muscle-cells form the parenchymatous part of the growth, while the stroma is formed by the dense fibrous or connective tissue. If, during their growth, the muscle-cells proliferate more rapidly than the connective tissue, we have a soft and more rapidly growing tumor, a myofibroma. If the fibrous tissue outstrips the muscle-tissue in ratio of growth, there is a condensation of structure, a slower growth often almost of stony hardness, a fibro-myoma.

From point of anatomical location they are described as submucous, subserous, and interstitial. All these forms

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may be present at once. The presence of these tumors stimulates the entire organ to increased growth with frequent hypertrophy and fungous growth of the endometrium. The physiological congestions incident to menstruation have an undoubted influence in favoring their development, as it frequently ceases with the cessation of this function.

Regressive changes, however, are more frequently seen to occur after this period. These changes may consist in the formation of cysts constituting the fibro-cystic tumors, due to the distension of lymph-spaces (lymph angiectasis) or to the distension of preformed sinuses and blood-vessels (telangiectasis). There may be fatty calcareous or myxomatous degeneration; or there may be a transition into sarcoma.

It is said that the first cases in which the uterus was removed in these cases, were cases of mistaken diagnosis. Burnham, of Lowell, Mass., did this in 1853. During the same year Kimball, of that city, first deliberately planned and carried out the operation. It is a source of great satisfaction to know that this was done by one of our own countrymen.

The evolution of the operation from that period to its present state of perfection need occupy our time no farther than to state that it was taken up by such men as Koeberle, Pean, Spencer Wells, Baker Brown, the elder Keith, Kaltenbach, Tait, Bantock, and others who placed it upon a firm basis. They all made a supravaginal amputation, treating the stump outside the peritoneum, using various methods of securing it in the lower angle of the wound. Koeberle used a small wire écraseur called the serre-nöud, while Keith used a powerful clamp which he devised for the purpose. The mortality was reduced to a very low percentage by Keith. In 1877 Kleburg suggested the elastic ligature in place of the wire loop for the constriction of the pedicle. Pean supplemented this with steel skewers passed through above it. This was a step in advance, but as in the other methods, the necrotic stump remained,

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with the slow process of healing and the inherent tendency to the formation of ventral hernia.

In 1881 Schroeder described his intraperitoneal method, which consisted in covering the stump with peritoneum and dropping it. With the advent of this method began a series of improvements which has resulted in giving us the perfected technique of Baer, Eastman, Kelly, and others.

Before taking up the various operations that are made today for these tumors, let us spend a few moments in studying the indications for operation. The indications may rest upon subjective or objective symptoms. The size of a tumor may hold no relation to the symptoms presented. A small submucous or interstitial tumor may give rise to serious hemorrhages, pain, and discomfort, while a relatively large tumor may give rise to few purely subjective symptoms or none at all.

Rapidity of growth may be a sufficient indication for operative interference.

Degenerative changes resulting in cyst-formation, whether lymphangiectic or telangiectic, may be considered as an evidence that a pathologic process has been instituted which will eventually demand removal.

It is easy to understand how necrosis may become established in the subserous variety by an accidental twisting of the pedicle which might result in sloughing, suppuration, and peritonitis by the localization of pyogenic bacteria in a soil so admirably prepared for it, thus demanding immediate operation.

Excessive menorrhagia or metrorrhagia frequently accompany tumors of the submucous or interstitial variety, which can be controlled by nothing short of surgical interference.

Pressure of the growth upon the pelvic or abdominal viscera may form a valid indication for operation. Cases are on record where intestinal obstruction was produced in this

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manner, while the bladder, ureters, and rectum may have their functions seriously interfered with.

Pain sufficient to warrant an operation may be produced by pressure upon nerve-trunks within the pelvis.

Pregnancy as a complication may, as in the specimen here presented, demand immediate operation. In this case the great mass of the tumor was below the pregnancy, so that delivery would have been out of the question. Pressure symptoms were extreme; vomiting almost constant, the patient being in a critical condition. The operation in this case presented no serious difficulties, and the shock did not seem excessive, but the vomiting continued, and death followed within twenty-four hours.

More or less ascites is usually present in cases where the tumor is of large size. In a smaller tumor with a slender pedicle, admitting of much mobility, the irritation of the peritoneum is sufficient often to produce a large amount of fluid, the tumor escaping the palpating hand until tapping has been resorted to.

The operations that are done for uterine fibroids may be divided into vaginal operations and abdominal operations. Those done through the vagina are: first, hysterectomy; second, ligation of the uterine arteries to diminish the blood-supply; third, enucleation of submucous tumors; fourth, morcellation; 5th, curettage.

In my judgment, interstitial or submucous tumors of the body of the uterus, small enough to permit of removal by vaginal hysterectomy, should be left alone unless there are strong indications for interference. If it were demanded by hemorrhage or pain, would resort to oöphorectomy combined with myomectomy if practicable.

We have heard considerable of late regarding the ligation of the uterine arteries to diminish the blood-supply to these growths. We are told that the ligature must also include the nerves at the base of the broad ligament. Personally

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have had no experience with this method as it does not seem to me to be based upon sound surgical principles. It certainly is not as logical as an attempt to accomplish the same end by inhibiting function and diminishing the blood-supply through the removal of the ovaries and ligating the ovarian arteries. When we consider the tendency to a restoration of circulation of a part by anastomosis, we have little reason to believe that if we escape immediate necrosis, the simple ligation of the uterine arteries would produce any lasting benefit.

Morcellation, or the removal of the tumor in detached fragments through the vagina, has long been resorted to in tumors of the submucous variety where it was impracticable to remove the growth entire. More recently it has been extended, largely through the influence of French gynecologists, to those of the other varieties, and even those of large size. It is advocated and practiced by some of the ablest surgeons, but when compared with a well-executed abdominal hysterectomy it seems clumsy and unsurgical, and must be so in ordinary hands.

Moderate-sized tumors occupying the cervix or the lower segment of the uterus, and especially the posterior surface, may be removed by enucleation, combined if necessary by traction and morcellation. Anterior or posterior colpotomy may often be made with great advantage in these cases.

Curetting may be necessary when the presence of the tumor has produced a hemorrhagic condition of the endometrium. It may be resorted to as a palliative measure in inoperable cases, or to conserve strength until such a time as a radical operation can be made. No lasting benefit can be expected from it.

Operations for these tumors made through an abdominal incision are: First, myomectomy; second, enucleation; third, oöphorectomy; fourth, hysterectomy, partial and complete.

Myomectomy consists in removing subserous tumors by

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cutting peritoneal flaps around the pedicle or base, controlling hemorrhage by ligature or buried sutures and closing the peritoneal defect by suturing. When there is a tendency to multiple formation, hysterectomy is much the better operation. The myomectomy may be combined with oöphorectomy.

Enucleation of sessile tumors can often be practiced through an abdominal incision. The great danger is that of opening the uterine cavity, a very potent source of infection. If this happens, the mucous membrane should be sutured if practicable, and the defect in the uterine wall closed by buried sutures. The same rule that applies to myomectomy in multiple growths, should govern here. In a number of cases I have made myomectomies and enucleations, removing the ovaries at the same time, because of multiple small tumors remaining, and so far as I have been able to follow the cases, they have been successful.

In small tumors, with a tendency to hemorrhage, the removal of the appendages and ligation of the ovarian arteries is often sufficient. Am aware that this has been abandoned in these cases by some of the later-day gynecologists, but it gives good results in my hands. In one case where I made a myomectomy and did not remove the ovaries, was obliged four years later to resort to hysterectomy, which I believe could have been avoided by oöphorectomy at the first operation.

In abdominal hysterectomy the great question to decide is: Shall we make it an intraperitoneal operation, either by opening the vagina from above, removing cervix and all; or make a supravaginal amputation, covering the stump with peritoneum and dropping it? Or, on the other hand, shall we resort to some measure that will enable us to deal with the stump outside of the peritoneal cavity? I think the majority of modern operators consider the question settled in favor of one of the intraperitoneal methods; but their results have been no better from a mortality standpoint than followed the

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work of Keith fifteen years ago, or Joseph Price with his serre-nöud to-day. The truth is that each method has its advantages and its objectionable features. It has been well said that when the abdomen is closed following an operation, the fate of the patient is all but sealed. If trouble follows, be it hemorrhage or infection, little can be hoped for by re-opening. This I believe to be especially true of the operations under consideration. Were I obliged to make my choice between the modern intraperitoneal method and the extraperitoneal constriction of the stump, to be followed by necrosis and sloughing, I should most certainly choose the former as conforming more strictly to modern surgical principles; but I am not obliged to make that choice. Nearly five years ago, Dr. Senn devised a method which, in my opinion, combines the desirable features of both methods with the objectionable features of neither. It allows of the complete closing of the peritoneal cavity, and at the same time leaves all cut surfaces outside that membrane. It makes serious post-operative hemorrhage impossible, as the ends of the divided vessels are within immediate reach and in a position where hemorrhage would at once be recognized. Instead of there being a necrotic and sloughing stump, the tissue is living and the wound heals throughout by primary intention. The extraperitoneal treatment of the stump by the old method has been justly criticised, because of the tension and dragging upward of the structures. By the method about to be described no tension is produced, the bladder, rectum, and vagina maintain their normal position and relation in the pelvis, and the tendency to hernia is minimized.

The principle of Dr. Senn's operation consists in cutting a cuff of visceral peritoneum around the base or pedicle of the tumor, which is united to the parietal peritoneum in the lower angle of the wound, allowing the stump, or cervix, to recede to a point nearly to its normal level.

Before proceeding to describe the technique, I wish to re-

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fer to a statement made in this Society one year ago, by my friend, Dr. Byron Robinson, of Chicago, regarding the priority of Lawson Tait in utilizing this cuff-method. Tait was, perhaps, the first to suture the visceral to the parietal peritoneum, but he did it below his constrictor which he used then and still uses, yielding the same necrotic stump. In the literature at my command on the subject, I can find no record of his making use of a cuff on the grounds advocated by Dr. Senn. In Dennis's System of Surgery, (vol. IV, p. 642,) Polk, of New York, cites a similar operation published several years ago. He made no claim, however, to an attempt to secure primary union. To Dr. Senn, therefore, I believe, belongs the credit of giving us this ideal operation.

The Operation.—After the abdominal incision is made, the tumor is lifted out in the usual manner, either by the hand, or with the aid of volsella or cork-screws. The abdomen may now be closed by suturing down to a point near the base of the tumor, or, as I prefer doing, may be closed temporarily by means of two or three double tenaculum catch-forceps. The broad ligaments are now divided between double ligatures down to a point a little above the level at which the amputation is to be made. A circular incision is made through the peritoneum, which is pushed down by the finger or blunt instrument. Very little hemorrhage occurs if the deeper structures are not invaded. The wall of the cuff carries down the bladder in front and rectum behind, and makes injury to the ureters almost impossible; when the uterine artery is cut it is picked up and ligated. The uterus is now cut away on a level with the bottom of the cuff, which is held by several catch-forceps. The cervical canal is excised well down into the cervix, and the cavity thus formed closed with buried catgut sutures. This effectually shuts off the vaginal communication with the stump. A heavy silk suture is now passed through the entire abdominal wall on one side, on a level with the posterior portion of the cervix, through which it

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is passed behind, or outside the cuff, and out through the abdominal wall opposite the point of entrance. The free ends are secured by a catch-forceps, to be tied later. This suture is not used by Dr. Senn, but it seemed to me that it would aid in relieving tension from the sutures securing the cuff. I have called it the suspension-suture. The cuff is now united to the parietal peritoneum in the extreme lower angle of the wound by means of a continuous catgut suture. Two or three provisional sutures are introduced through the abdominal wall, cuff and stump. These are also secured by catch-forceps, to be tied finally. The abdominal wall is now closed in the regular way down to the cuff, after a careful toilet of the peritoneum has been made. The suspension-suture is next tied, care being taken to simply relieve tension on the cuff-sutures. The cavity within the cuff is next packed loosely with sterilized, or iodoform gauze, and the provisional sutures tied in bow-knots over it. This packing is removed at the end of twenty-four hours, when the surface will be found fresh and bleeding. The sutures are now tied and cut short. The wound usually heals throughout by primary intention.

I have used this method in twenty-three cases during the last four years. Of these, six died. One, the case complicated by pregnancy, which has been mentioned; one died from uremic poisoning, and which I attribute to ether. Three deaths were from sepsis, all following in close succession, the cause not being discoverable until too late, so that none of the deaths can be charged to this method, as they would have died had I used any other. The last fatal case proved to be a fibro-sarcoma with extensive adhesions, death following in a few hours from exhaustion. With the exception of this case, have had nine consecutive recoveries.

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LIGATURE EN MASSE.

BY F. SHIMONEK, M. D., OF MILWAUKEE.

As the name indicates, the tissues of the broad ligaments are brought together in such a way that the pelvic part on one side comes in contact with the uterine part on the other, in other words, the broad ligaments are massed or puckered, thereby bringing the pelvo-infundibular fold in direct contact with the utero-ovarian ligament, thus, instead of the Fallopian tubes skirting along all of the way of the free edge of the broad ligaments, we have the ligamentous tissue partially in its place.

The term is now used in contradistinction to another method, in which this *modus operandi* is displaced by a simple ligation of the ovarian arteries at the pelvic and uterine sides; the tubes are individually dissected from their places, and the balance of the ligaments remain *in statu quo.*

The advantages of the *en masse* method are chiefly in the direction of the influence exercised through the then tenser tissue upon the antero- and postero-uterine deviations.

It may readily be seen that by increasing the tensity and tonicity of a loose or relaxed ligament, whose main object is to maintain the position of an organ whose range of motion depends to a certain extent upon it, the probability of a future deviation is somewhat lessened.

In addition, the round ligaments being the anterior stays, may be simultaneously and intraperitoneally shortened with the same ligature with which the ligamenta lata are secured.

The ligature is passed beneath the round ligament, which, when tied, brings it into contact with the stump of the broad ligament.

While it is advocated by many abdominal surgeons to suspend, or ventro-fix, the uterus when it becomes necessary to open the abdomen for adnexal disease, but inasmuch as the majority of septic or specific inflammatory diseases of the ap-

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pendages are transmitted from the uterus by the continuity of the tissue, or through its lymph-channels, it may become necessary in the future to remove the uterus, therefore, it must be admitted that a ventral adhesion might materially complicate a vaginal hysterectomy; and for that reason, I believe, where it may become necessary to complete the cure by a subsequent removal of the uterus, it is best to include the round ligaments in the ligature in preference to forming an abdominal adhesion, and to trust to this combined influence in maintaining the normal level. The rapidity with which an *en masse* ligation may be done might be an important item in debilitated patients requiring a speedy termination of the operation.

The sole disadvantage of this method, is the impossibility of removing the entire Fallopian tubes at the same time; there is, necessarily, a stump left, of variable length, between the ligature and the uterus.

In extensive infectious diseases a partial oöphorectomy is insufficient, for the valid reason that a nidus of infection is left which cannot be reached by any therapeutic measures, which, in all probability would keep up the previous trouble; consequently the entire and thorough removal of the tubes by a careful dissection extending even into the uterine horns, is positively indicated.

I am very well aware that anything short of a complete removal of all diseased tissues, *i. e.*, uterus, tubes, and ovaries, in septic or specific diseases, is regarded by many operators as extremely inefficient work; but those on the other side claim that a uterus is under the same physiological laws with the balance of the organs, and subject to the same beneficial natural influences, and that it may be restored to perfect health through the assistance of proper and thorough therapeutic treatment. I believe that no organ should be sacrificed that does not positively have to be; we know that a

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gonorrheal joint gets well; it may be handicapped somewhat in its function, but it is to all intents and purposes well.

The pelvic exudates and adhesions in the region of the amputated tubes frequently necessitate reopening of the abdomen, so, rather than to expose a patient to another celiotomy, it is by all means preferable to get rid of all vestiges of the irreparably diseased tubes.

Watkins gives the following advantages of the ligation of the ovarian arteries over the *en masse* ligation:

First, no pedicle is made; *second*, the entire tube and ovary can be excised; *third*, very little tissue is included in the suture, and very little tension is made on the broad ligaments; *fourth*, little or no raw surfaces remain to form adhesions or cicatrices; *fifth*, absorbable suture may be used without fear of hemorrhage; *sixth*, blood-vessels are ligated while in normal location, which protects against retraction and hemorrhage; *seventh*, where the broad ligaments are friable, hemorrhages can be more easily controlled by suture than by ligation *en masse; eighth*, bleeding points in the posterior surface of the broad ligaments are more accessible after suturing than after the broad ligament has been puckered by ligature.

The only real advantage that this method possesses over the other is, as has already been stated, the possibility of removing the entire diseased tubes. All the other alleged advantages, it seems to me, are without foundation.

So far as the pedicle is concerned it may be safely tied with catgut just the same as when the blood-vessels are tied separately; I have yet to see hemorrhage after catgut.

There does not have to be any raw surface left for adhesions to form, the application of potential cautery is sufficient to avoid the danger as also that from hemorrhage, or, if greater safety be desired, each blood-vessel might be secured separately by a fine catgut in the stump; this, I believe, is superfluous.

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Respecting the tension of the broad ligaments after *en masse* ligation, this is, according to my belief, beneficial.

Methods.—There are the four following methods:

First, the method of Wallich, the oldest and the most widely used, and which is yet resorted to very frequently in spite of the fact that the present methods are far superior in every respect. It is done in the following way: a double ligature is passed through the pedicle and is cut, thus transforming it into two ligatures; now the threads are crossed and the opposite ends are tied on one side of the pedicle and again tied on the other side to constrict the broad ligament.

It is a known fact that the more knots that are made and left in the peritoneal cavity the greater are the chances for secondary infection; and particularly where silk is used, which remains long, it is constantly endangering the peritoneal investment by the friction through the peristaltic movements against the knots, and it is self-evident that the danger increases with every knot.

This is the explanation of abscesses forming weeks and months after an operation. A little lesion is produced upon the intestinal surface by attrition against a knot; the protection offered by the peritoneum is destroyed; the colon bacillus passes through the intestinal wall, comes in contact with the porous silk which by its capillarity distributes it throughout the entire ligature, and an abscess is the result, which is frequently laid at the door of imperfect sterilization. I had an unpleasant experience of this kind: four months subsequent to a laparotomy an abscess developed, with the final discharge of the ligature and the almost immediate closure of the fistula.

Another objection to this ligature is, that where a rapidity of action is required, one may overlook the crossing of the threads; then, when tied, the result is that a large hole is formed in the pedicle instead of a close approximation of the

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tissues, and there is great danger of hemorrhage. This very thing occurred to me but was observed in time. This mishap led me to think, and finally to the evolution of my figure of 8 ligature.

The Tait, or the Staffordshire ligature, came next rapidly into prominence. It certainly is an important improvement over the preceding.

A long loop is passed through the pedicle; the needle is removed; the loop is pulled out far and brought over the tumor and placed between the free ends, which are tied; the loop is tightened sufficiently around the pedicle, but occasionally the loop gets caught by the tightening knot which, through the increased friction, either breaks or it makes it impossible to tie safely. It may not occur very often yet it is a serious disadvantage.

The next ligature is very good; who the author is I am not able to say.

A loop is passed through the pedicle and cut; there are now two threads in position; the ends of one are tied around one-half of the pedicle, brought back around the other half and tied; in case the first one breaks while being tied there is still the other half left *in situ* which is removed when it does not become needed.

With this ligature very quick work may be done, but the same objection in reference to the multiplication of knots holds good here.

The one I had the pleasure to devise has proven itself superior in my hands to all of its predecessors. I have now used it for about two years in quite a number of cases with the greatest of satisfaction and confidence. The execution is very rapid and it matters not how quickly it be done, it is impossible to have bad luck with it, so far as my experience goes. Of course the ligature material may break, but that is due to an imperfection of it and not to any shortcoming of the method. I have already published it and it has also ap-

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peared in the Year Book of 1898. It is so simple and effective and consequently entirely satisfactory, that I feel it my duty to again call the attention of the medical professson to it.

It may be done with the ordinary pedicle needle; an aneurism needle; a Cleveland's ligature-carrier; or with any large needles threaded at each end of the ligature. I now use the Cleveland ligature-carrier.

The ligature is grasped with the carrier near the end of it, and is passed through the pedicle; the ligature is now released from the grasp of the carrier, the opposite end, or the one corresponding to the handle of the carrier, is made to encircle one-half of the pedicle, and now grasped again and is pulled through the pedicle. We now have a loop on one side, the threads passing and crossing through the pedicle are tied on the other side. The firmer the traction is made on the ends, the tighter becomes the loop.

If the pedicle is too broad to be securely tied with one figure of 8, it may be easily continued and the free ends tied.

DISCUSSION.

Dr. Robinson: I have had considerable experience with that method of operating, using either the Staffordshire knot or the figure of 8 knot, and I wish to say that if anybody wishes to remember my advice, that they will be very cautious about using either, for I have seen death following the first knot. I have seen the knot slip, and the patient bleed to death. Dr. Shimonek brings out a very ingenious method of ligating the broad ligament, and I wish to say that I have performed a good many of those kind of operations, and I have quit it entirely, because experience shows that in those cases the smaller the pedicle the better. I have fistulas going six months, two years and four years, due to those kind of ligatures. I do not put silk in the abdomen any

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more if avoidable. I use the smallest catgut on the isolated artery and graft over as much perineum as I can. Another thing: a figure of 8 knot is apt to produce a necrosis. Then, too, though the operator ties it hard, it may be loose in four to six hours, or at most in a little while, and then that big wide loop has got to be absorbed, and it is very nearly always infected. I only put catgut in the abdomen, carefully prepared, and with as few ligatures as possible, that is with as short pieces of ligatures as possible, and only on the arteries. I have had agony over ligatures in the last seven or eight years. The other day I was in one of the largest catgut supply houses of Chicago. The nurse hired there is a special nurse, and she said that in Chicago everybody is tearing his hair about catgut. The less ligatures of any kind we can put in the abdomen the better.

Dr. Shimonek: Dr. Robinson says that we nearly always have necrosis of the pedicle, and in the very next breath says we have a loosening of the ligature in three hours.

If we are to understand from this that the necrosis is due to sepsis and the consequent loosening of the ligature, then it follows that the same condition may complicate any method, it is simply a question of asepsis.

It is not true that necrosis of the pedicle "nearly always follows *en masse* ligature in ovariotomy."

The necrosis, or rather, atrophy of the pedicle after ovariotomy is due simply to the loss of nutriment from the constriction of the blood-vessels, which is a process of longer duration than three hours.

I have seen a pedicle eleven months after an ovariotomy atrophied with the silk ligature still *in situ*, and everything looking well.

I believe that Dr. R. had the pedicle after vaginal hysterectomy in view, and even here, where infection so easily

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occurs, will necrosis be far enough advanced in three hours to loosen the ligature? and even were it true, the blood-vessels would be completely thrombosed and no hemorrhage could occur.

I prepare my own catgut and have yet to find trouble from it.

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POSTERIOR COLPOTOMY, A CONSERVATIVE SURGICAL PROCEDURE.

BY A. J. PULS, M. D., OF MILWAUKEE.

When, in operating for chronic diseases of the female generative organs within the pelvic cavity, the question arises, how to operate, not alone exact diagnosis but close discrimination is necessary to select the proper methods for each individual case. Past experience has taught that the results of the abdominal method and those of the vaginal procedure do not satisfy our expectations.

During an advanced operation we often find it advantageous for the safety of the patient to change our methods of operation. A sharp line need not be established to define the field limited to celiotomy or to colpotomy. The suprapubic is the customary route of entrance to the abdominal and pelvic cavities, yet when we take into consideration that the vaginal route affords an easier access to the pelvic floor, and see the repeated demonstrations of good results from vaginal section for pelvic diseases, it seems that a combination of both methods may be found at times very expedient to the gynecologist.

Those following the vaginal method unfortunately extend the indications for operation to the entire field of intraperitoneal pelvic surgery, and consider themselves prepared to meet all kinds of pelvic affections requiring operative interference. On this account the vaginal operation is falling into discredit, because in order to accomplish its purpose, very often the uterus is sacrificed or mutilated and the intestines perforated or otherwise injured. Frequently the operation is abandoned on account of firm adhesions, or excessive hemorrhage compelling the operator to resort to the suprapubic incision.

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No differences of opinion exist in regard to the treatment of simple pelvic abscesses or serous exudates within Douglas' pouch. Evacuation of the fluid collection followed by drainage invariably effects a cure.

However, the views of the modern gynecologists are diametrically opposed respecting the operative treatment of chronic pelvic affections complicated with parametric adhesions. In abdominal operations the first procedure is removal of the diseased uterine appendages; next enucleation of the masses of inflammatory tissues, and drainage if needed; whenever extirpation of the sac is found impracticable the same is brought to the edge of the lower angle of the wound and secured by suturing to the abdominal wall. By the vaginal route the operator explores the inflamed tissues, breaks up the pus-foci and exudative material, and then drains. Unless he follows the directions of the French school which advocates "uterine castration," he removes the appendages together with the uterus.

Statistics do not prove the superiority of either suprapubic or vaginal celiotomy (Veit). The ultimate results each operator must find for himself in the health secured to the patient, and in its permanency.

Minor surgical operations done at the proper time and under correct methods are of greater value than the results obtained by heroic surgical procedures.

Our object in operating for pelvic disease should not be an attempt to accomplish a surgical feat, but preference should be given the simplest method, mindful of the fact that a second interference may be required. First of all we strive to save life and expose our patient to no great risks.

Several months ago two cases of pelvic abscess came under my observation and treatment. In both, pus had ruptured into the bowel and was discharging freely through the rectum. In the first case, subsequent to puerperal sepsis, pus was noticed in the stools almost daily for six months; in the other

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the pus had perforated the bowel on the day previous to my seeing the patient. Posterior colpotomy and thorough drainage of the pus-sacs gave immediate and gratifying results.

Wherever pus can be located in the periuterine tissues, its removal by a vaginal incision is indicated in order to prevent destruction of the neighboring tissues. Inflammatory pelvic disease, unless arrested, is known to lead to a chronic stage, producing hard and firm indurated masses, shortening and thickening the uterine ligaments, forming within the parametric tissues serous and finally pus exudation.

A very large percentage of acute inflammatory pelvic processes are no doubt amenable to an expectant plan of treatment. Resorption of the exudative masses surrounding the uterus proceeds slowly to a final resolution of the exudate. A knowledge of the cause of the infection and history of the case, is necessary to establish the right course of treatment at the onset for the arrest of the disease.

Invalidism and long confinement due to chronic affections of the pelvic organs can be traced to the enclosure of pus which has withstood resorption for months and even years. Removal of the encysted pus is often followed by immediate health, without need of extirpation of the generative organs.

The pus-focus must be attacked at the anatomical point most accessible. The exudate, being walled off from the abdominal cavity and therefore extraperitoneal, an incision can be made: First, through the posterior vaginal vault; second, through the anterior vaginal vault; third, above Poupart's ligament.

In a case where pus was forcing its way upwards from the pelvis into the iliac fossa, being detected under the abdominal wall above Poupart's ligament, there was apparent recovery after incising and draining the abscess which led into the pelvic cavity. But six weeks later the same process developed on the other side of the abdomen. A similar procedure was finally effectual, and the patient made a good recovery.

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Pyosalpinx and hydrosalpinx closely adherent to the vagina can be permanently cured by an incision and drainage into the distended sac without removal of the tube. To prove the value of posterior colpotomy in double pyosalpinx without removal of the sac, the following case is cited:

On bimanual examination I found the uterus wedged in by two distinct tumors. On the right the tumor felt as large as a child's head, and was low down in the pelvic cavity; the other tumor was smaller, higher, and not so closely connected with the vagina. It was necessary to make a separate incision into each pus-sac through the posterior vault. Drainage was made with iodoform gauze. Although this was done a year ago the patient has remained well ever since. At the time of operation abdominal section was out of question, since the very thick and firm adhesions of the sac to the pelvic floor would have resisted an attempt at enucleation.

Of late, anterior as well as posterior colpotomy is practised for the removal of small pelvic tumors. Separation of uterine adhesions and fixation of the uterus to the vagina by anterior colpotomy are preferable methods in some cases, especially whenever vaginal or perineal operations are indicated on the same patient. But the selection of the vaginal route to avoid a large abdominal scar or to prevent subsequent ventral hernia is unnecessary, since both objections may be obviated by correct suturing of the abdominal wound.

Pelvic hematocele or retro-uterine hematocele can be safely incised through the posterior vaginal vault and relieved by emptying the hemorrhagic contents.

Tubal pregnancy, ruptured into the broad ligament, may in course of time present itself as an ordinary retro-uterine hematocele; the products of gestation becoming absorbed by the peritoneum, the coagula and liquid blood completely filling Douglas' space, and gradually crowding the uterus towards the symphysis pubis. For ruptured tubal pregnancy, poste-

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rior colpotomy has been repeatedly done with marked success. A number of my own cases have convinced me that the vaginal route is attended with less shock than I have noticed after a laparotomy. However, in extra-uterine gestation before the period of rupture, or during rupture into the free peritoneal cavity, the hemorrhage is checked more easily and safely through inspection gained by a suprapubic incision.

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STRUCTURES INVOLVED IN COLPOPERINEORRHAPHY.

BY BYRON ROBINSON, M. D., OF CHICAGO.

The offering I have to present to the Society this year, is a thesis on Colpoperineorrhaphy. I shall only present a few views in regard to the subject, as the program is quite full, but I want to present a few ideas that I think are established, and I have here a presentation of the subject which I wish to elucidate as follows:

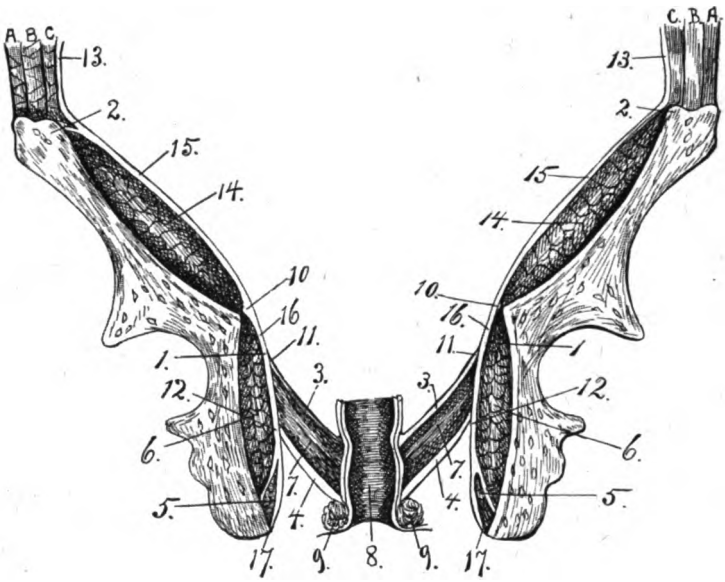

FIG. I. (ROBINSON-SCHOELER.)

This cut is to represent the fasciæ of the pelvis. In it the fascia is named according to the structure with which it is most intimately associated. Especial attention is directed to the levator ani fasciæ superior and inferior, which constitute the chief structures to reunite in successful colpoperineorhaphy.

1, 1, White lines; 2, 2, iliac crest; 3, 3, levator ani fascia superior; 4, 4, levator ani fascia inferior; 5, 5, Alcock's canal; 6, 6, obturator internus muscle; 7, 7, levator ani muscle; 8, 8, rectum; 9, 9, sphincter ani externus; 10, 10, ilio-pectineal line; 11, 11, origin of levator ani

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fascia superior; 12, 12, origin of levator ani fascia inferior; 13, 13, transversalis fascia; 14, 14, iliacus muscle; 15, 15, iliac fascia; 16, 16, obturator fascia superior; 5, 5, also points to obturator fascia inferior.

The levator ani fasciæ superior and inferior, for diagrammatic purposes, are separated at the origin; they should originate from one and the same line. The new nomenclature here introduced will avoid confusion by naming the fascia according to its associated structure.

This drawing represents the outlines of the pelvis in which I have drawn some black lines, and the object of that is to show that I have renamed some of the pelvic fasciæ in order to make it simple. Now the fascia from the top of the iliac crest, which is marked iliac fascia, extends down as far as the line marked ilio-pectineal line; that is not changed, but the fasciæ below are renamed. From the ilio-pectineal line down to the line marked white line, the fascia is called the obturator fascia superior, and the fascia extending from the white line to the tuberosity of the ischium is called the obturator fascia inferior. That is a very simple nomenclature, as it simply divides the fasciæ from the ilio-pectineal line into obturator fascia superior and obturator fascia inferior. Second, and the especial change to which I wish to call your attention, is that the fasciæ covering the levator ani muscles shall be called the levator ani fascia superior, and the levator ani fascia inferior. The principal difficulty has been that these parts have been called by a dozen different names. Tyrrell, for instance, about 1840, gave the name of rectovesical to this fascia, and that is the general name now employed. Others have called it the pelvic fascia or pelvic aponeurosis of Carlosonne. Now I name the fasciæ with reference to the structures or muscles to which they are respectively related. All the fasciæ in the pelvis are named after the associated muscle or bone. I exhibit to you here a pelvis, dissected, and what I am going to prove is this: that the floor of the pelvis, beginning in front, shall be named the fascia levator ani superior, the coccygeal, the pyriformis and sacral fasciæ. I have been trying to establish the structures involved in successful colpoperineorrhaphy. The perineum is an unfortunate word, because a general physician attaches too much importance to it. It might sound

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strange to you that the essential structures in colpoperineorrhaphy have not been established until very lately.

I will say that my thesis on colpoperineorrhaphy is dedicated to Dr. Thomas Addis Emmet, of New York, who has done more for gynecology than any living man in America, and second it is dedicated to Mr. Lawson Tait, of England, who has taught us about all the best we know of abdominal surgery. I dedicate it to them in recognition of their labors in the surgery of the perineum. I can guarantee you that it is not easy to absolutely demonstrate the facts of the essential anatomical structures. What are the structures that make a successful perineorrhaphy? Allow me to claim that they are: the levator ani fascia superior, and the levator ani fascia inferior, and deep suturing. These are the structures which alone will make a successful colpoperineorrhaphy, which includes rectocele and vaginocele. I do very few vesicoceles, because with colpoperineorrhaphy I can cure them, because the posterior vaginal curve is re-established, which supports the anterior vaginal wall.

Here is a pelvis carefully dissected, out of quite a number.

I probably dissected, of men, women, and children, forty pelves, in order to satisfy myself which is the structure which I am so anxious to secure. And also I want to say that Dr. Lucy Waite and I have practised one hundred colpoperineorrhaphies by the Tait method. Now the fasciæ are very thin structures. The levator ani muscle is not thicker than two sheets of paper, or a towel, and not so thick sometimes. It must be announced now and forever, that the levator ani muscle cannot be considered a support for the uterus in a tensionized condition—and no muscle is naturally in tension—therefore it is not the levator ani muscle which is so frequently met with in the books written by gynecologists who do not do dissections, that we must rely on. I made a large number of dissections of pelves running over ten years, and I have a pelvis here that absolutely demonstrates that to do a

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successful perineorrhaphy we must include the levator ani fasciæ superior and inferior.

You see the H-shaped vagina, which Henle showed us. This specimen is from nature, and I hardened it with formalin. You will notice the thin levator ani fasciæ superior and inferior, about as thick as a towel, but very strong.

Outside is a fascia less dense and more pliable, and on the right side I dissected it off the levator ani. You see that the levator ani fasciæ superior and inferior, originally called by different names, insert themselves directly into the rectum, or the anus, about $\frac{1}{4}$ or $\frac{3}{4}$ of an inch only above its margin. Now, the perforation of the rectum nearly always occurs below the levator ani fascia inferior, which is an important thing to remember in operating. Why is the vagina H-shaped? Because when the levator ani muscle is at physiological rest, the fascia covering it forces the vagina from backwards, forward. Then again the vagina is a much larger tube than the rectum, and hence it has to fold on each side, presenting H-shape.

My subject can easily be summed up, through a large number of dissections, by stating that the subjects to be included in the perineorrhaphy, are the levator ani fascia inferior and the levator ani fascia superior, for the levator ani muscle cannot be gotten together without its fascia, because it is so thin.

Again which perineorrhaphy is going to be successful? There are two kinds of perineorrhaphy alone that are successful, first the one of Dr. Emmet and the one of Mr. Lawson Tait. You say that they are totally different, but the fact is, that they are absolutely the same thing, excepting the flap. That is where the misunderstanding takes place. Tait introduced, towards 1875, simply the idea of getting the flap and to protect the wound. Emmet's is founded on the same principle. A German professor, Dr. Schatz, showed in the same year that Emmet came out with his famous ideas, that

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it is the pelvic fasciæ that makes successful perineorrhaphy—Schatz and Emmet have the same views, and Tait's operation is based absolutely on the same principle. Tait revived the flap idea. Langenbeck gave us the flap first in 1850. The flap does not allow the wound to become infected. The reason that Emmet's operation is as successful in general as Tait's, is that nearly all wounds heal in the vagina. Tait pulled one flap forward and another flap backward. Therefore he has both wounds covered. The surgeon wants skin or mucous membrane to cover his wounds, to be successful. I wish to say that the way Emmet accomplishes the same effect as Tait, is that Emmet goes high up in the lateral gutters in the vagina and makes a triangular flap and then introduces the sutures, which are deep and hence successful. When Emmet pulls the sutures up they pull the posterior vaginal wall and rectum forward, for it is the function of the levator ani muscle to draw the rectum and vagina forward and upward.

Lately, Dr. Lucy Waite and I adopted a new plan, namely, to dissect the rectum from the vagina, from one to two and a half inches.

Emmet says there is a crown suture put away up through the levator ani fascia inferior and the levator ani fascia superior, and when he pulls it it brings the vagina and rectum forward. Allow me to say that I did not come here with a chip on my shoulder as announced, and, of course, while I would like to discuss Dr. Oviatt's paper for personal reasons, yet I appreciate the press of business which compels the Society to forego part of the discussion. I have brought here a year's labor, and it may seem a very small matter, yet I have worked all the time on it, and I am personally satisfied what it is that makes successful colpoperineorrhaphy, and that is deep suturing of the levator ani fascia superior and the levator ani fascia inferior. This was essentially stated by Hegar, who said you must include the adjacent perineal tissue and force it in the median line. Schatz made the same statement in 1883. Tait

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did it practically without recognizing the usefulness of his operation; but the value of this method is now recognized throughout all the civilized world.

DISCUSSION.

Dr. Burgess: I wish to congratulate Dr. Robinson on the fact that he has presented the absolute truth in that paper, and anything that deviates from the principles that he has laid down in the paper that he has read to us, is wrong. The strength of the closing of the wound depends very largely, as he says, of the fascia, the very purpose of which is to bind down parts and hold them in apposition as they should be. What are the aponeuroses of the muscles of the abdomen for, except to hold the contents in where they belong? The reason why so many perineorrhaphies are useless, is because this simple fact has been ignored. It is very easy to have a cloudy and unclear idea of a thing, and then establish a rule for treatment as has been so frequently done. Many operators have no idea of the anatomical structure of the parts. They read laboriously the descriptions of the operations without really understanding them, and then do the operation as they understand it to have been described, and oftentimes perineorrhaphy so done is nothing but a skin perineorrhaphy, and such an operation is of no use, and can be destroyed with one clip of the scissors, but when once the fascia of levator ani superior, (I like that term,) is brought in apposition as it should be, and the inferior fascia in the same way, the muscle cannot help being in apposition, and the points of its attachment that have been separated by the tear originally, are brought together and the part restored to its natural order, and it is correct. I congratulate Dr. Robinson.

Dr Almon Clarke: I would like to ask Dr. Robinson if he does not understand this idea to be practically the same as that advocated by Dr. Henry O. Marcy, of Boston, in his work on the perineum.

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Dr. Sifton: I wish to congratulate Dr. Robinson on the amount of work that he has done, and I believe only those who have done dissections of the pelvic fasciæ can appreciate the amount of work required. I wish to endorse every statement that he has made in reference to this pelvic fascia that is spoken of. His statements are absolutely correct, as Dr. Burgess has said, and as I know from personal experience in dissections.

Dr. Robinson: I wish simply to say that in the thesis Dr. Marcy's operation is carefully considered.

I hardly think that Dr. Marcy has exactly the same procedure, but it does not differ much. I have read Marcy's thesis very carefully, and it is on the same principle that Langenbeck, Simpson and others have employed; that is where they split up as high as they think is necessary, and stick in a long needle and trust to luck to get behind the fascia. After all he forced his needle nearly up as high as Emmet and Tait did, but he does not explain the reason of the operation. I wish to say that I thank you, gentlemen, for the courtesy with which you have received this subject, and treated myself.

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VAGINAL HYSTERECTOMY — CLAMP METHOD.

BY E. F. FISH, M. D., OF MILWAUKEE.

Professor of Gynecology, Milwaukee Medical College.

The technique of vaginal hysterectomy by the clamp method, where the size of the uterus is not materially altered by pathology, is so well understood by all who make the faintest pretensions to gynecology, that it would seem like superarrogance on my part to attempt to add more to the subject. Neither do I care on this occasion, to waste the valuable time of the Society in narrating the history of the operation, from its inception to its present stage of perfection. Nearly all surgical operations are comparatively easy to one schooled in the technique, provided the pathological changes do not materially alter the anatomical relations of the parts to one another, or efface valuable land-marks, or both.

Vaginal hysterectomy, especially when the clamps are used, and when the uterus is mobile, and of normal size, can almost be classed under the head of minor gynecology. It is when changes have taken place, that the difficulty begins; it is such changes which led to morcellation, uterine division, etc., and which is the keynote to this paper.

Large hystero-fibroids extending even to the umbilicus, are removed per vaginam by morcellment; and where the uterus is not materially enlarged, but too much so to admit of turning down the fundus in the vagina, and where the secretions are negative, splitting of the womb simplifies the operation. To-day, I wish to direct your attention to a pathological condition which is quite common, but concerning the surgical management of which too little is said. I refer to submucous, sessile fibromata, in the uterine fundus or high up in the

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body, and to other growths which cause the uterus to enlarge and are accompanied by a profuse, fetid discharge.

In such cases, where the enlargement is not material, the uterus can be curetted and packed, the cervix cauterized and even closed with stitches, and the operation proceeded with in the usual manner; but where the growth and hypertrophy have become so great that ordinary means fail to turn down the fundus, and where the discharge is foul and profuse, the operation is generally done by celiotomy.

It has been said that only he should attempt vaginal hysterectomy who has long and strong fingers. This would be unfortunate for the stubby individual, if it could be classified under the head of criminal practice and protected by a stiff penalty. The class of cases to which I have referred is accompanied by a grumous, bloody, foul discharge, and it is often difficult to differentiate between benignity and malignity. To remove the lower segment of the uterus and turn the raw, putrid surface into the abdominal cavity, would be to invite infection, to split the uterus would be equally dangerous, and hence under such circumstances it is necessary to turn the fundus down or remove the organ through an abdominal incision. I can, perhaps, best illustrate the method I have employed, in the management of seemingly impossible vaginal hysterectomy, by describing an interesting case. February 6, '98, I was called in consultation with Dr. Ladoff, to a Mrs. E., aged 49 years, weight 225 pounds, general appearance good. She was suffering some pain, was very weak, and there was a profuse, fetid, bloody discharge from the uterus, of long standing. The organ itself was enlarged several times its normal size, and felt hard, almost indurated. Taking the history of the case into consideration, I confirmed the diagnosis already made by the doctor, that of uterine fibroma, possibly malignant. An operation was advised, and the patient taken at once to Trinity Hospital. Acting on the urgent request of relatives, and in consideration of the

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weakened condition of the patient, we first curetted and applied local treatment, but without any improvement. We then proceeded to the radical operation, hysterectomy. I had only a faint idea that the uterus could be removed per vaginam without morcellation or section. This I determined in advance not to do, as the discharge seemed to come from all parts of the uterine cavity, and peritonitis would almost certainly have followed. My plan was, to begin in the vagina, and if I failed to complete the operation in that way, to finish by abdominal section, as done by Watham, Gordon, and others. The patient having been properly prepared and anesthetized, the cervix was loosened, and the first clamps applied high on either side. The uterus was then cut free to their ends. My fingers were passed through the anterior fornix to the fundus, and I attempted to pull it forward, but could not, as my fingers were too short; so I pushed up a volsella, and with it grasped the uterus, and succeeded in pulling it to the front. A volsella will invariably tear out, when the least force is used, and did this time, leaving me uncertain what to do. The thought struck me to pass a heavy number 12 silk ligature through the anterior side of the uterus, and acquire purchase in this way.

It worked well. This anchor was superseded by one a little higher, and this by another, as near the fundus as possible, when finally, to my gratification, a uterus weighing fourteen ounces was turned into the vagina, clamped and excised. This result was materially aided by Dr. W. P. Coakley, who crowded the organ downward and forward by pressure above the symphysis. Another case which I intended to report in full, but do not, owing to the time-limit, was operated on at the Milwaukee County Hospital, with Dr. Grosskopf as my assistant. It was almost exactly the same as the case reported. I mention it simply to show that the procedure is not impracticable. The points which I wish to bring out by this paper, are these: That when there is a profuse, fetid dis-

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charge coming from the entire uterine cavity, morcellation or bisection of the organ is attended with great risk, and is contraindicated.

That when the uterus is hypertrophied to such an extent that ordinarily abdominal section would be the operation of election, the uterus can often be crowded down by an assistant, and the fundus pulled into the vagina by a series of heavy silk ligature-guys passed through the uterine muscle interrupting toward the fundus.

That after applying the clamps along the lower segment of the uterus, the organ should be freed to the ends of these instruments. One thing which adds greatly to the difficulty of turning the fundus uteri into the vagina, is failure to free the uterus to the ends of the clamps. Indeed this very thing of itself may suffice to prevent the accomplishment of the desired object. In applying the clamps, one should be pushed up on the anterior surface of the uterus, and one on the posterior, and gradually brought together, sliding them outward so as to crowd away and avoid the possibility of clamping the ureters. Ordinarily, such cases as I have reported are operated on by the abdominal route, and the question might well be asked, "Why not at once make this the operation of election?" I can only reply, that these women were large and fleshy; the abdominal muscles were atrophied and covered with great wads of fat; that under such circumstances, abdominal hysterectomy, at best, is very difficult, necessitating a long incision, thus adding mnch to the gravity of the operation. Accordingly in my judgment, vaginal hysterectomy is by far the preferable method when practicable. The big abdominal scar is not left as an everlasting reminder of asexualization; the possibility of ventral hernia is, of course, averted; there is scarcely any shock even after the most difficult operations; the danger of sepsis is minimized, especially in the class of cases mentioned, and convalescence is rapid.

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THE COUNTRY PRACTITIONER AS AN OBSTETRICIAN — HIS DUTIES — HOW TO AVOID AND HOW TO TREAT SEPSIS.

BY N. M. DODSON, M. D., OF BERLIN.

The nativity of man is marked by an enormous mortality, both of the mothers, in the fulfillment of their allotted function the continuance of the race, and of the offspring, ready to begin life and to take their places among the people of the earth. The success of the wisest and best obstetricians since the introduction of aseptic management, has demonstrated that maternal and infantile mortality may be immensely lessened—almost eliminated. To this end the opportunities and advantages of hospitals greatly conduce, but these aids are not now under consideration in this paper.

The country practitioner must accept the situation as it is, and be prepared to do his work in such a manner that no lives may be lost through his want of care, or want of knowledge and skill.

It is to be expected that the city practitioner will, in the greater proportion of his cases, have the prospective mother under his observation for some portion of the period of pregnancy, and be able to foresee and avert the great and formidable danger of eclampsia, by careful examinations of the secretions, and in general to secure a normal physiological condition of the patient. When not so informed and employed, his position may resemble that of the country doctor, who is seldom consulted or employed until the pains of approaching labor bring him to the bedside. If consulted, as ought always to be the case, he should never neglect to make sure that all the secretions and excretions are normal. He should carefully examine the urine at intervals, for although

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cases are reported of puerpural convulsions where no albumen could be found in the urine, it is yet certain that greater safety will be found in the free elimination of all the excretions. It is important to know the total amount of solids which is being eliminated in the urine each day. To do this have the urine passed into a clean vessel for twenty-four hours and its total amount carefully measured. Then take its specific gravity by a standard urinometer, and the last two figures multiplied by Hasser and Neubauer coefficient 2.33, gives the total solids in parts per thousand. If, for example, the total amount passed is 1500^{cc}, (fifty fluid ounces,) the full normal amount of specific gravity is 1022, then the solids will be 76.89 grains. If the total solids thus estimated only reach 30 or 40 grains, the evidence of defective elimination will be conclusive, and makes your duty in the case clear to promote increased elimination by the use of the most efficient diuretics aided by laxatives, sudorifics, the warm bath, etc., etc. If all this has been attended to, and you secure a normal flow of normal urine, you may have little fear of that terrible complication of labor, convulsions. Advice should be given with regard to all those hygienic measures that make up a full condition of health: pure air, frequent bathing, moderate not excessive exercise, and the most encouraging assurance of a happy termination of the long period of pregnancy. All these contribute greatly to the patient's comfort and safety. Never neglect to prepare the breasts and nipples for the coming rough usage, by friction, and the use of alcohol or other stimulating and astringent applications.

When the call comes give it your immediate attention, and first assure yourself of the pregnancy.

I have known at least two instances of a practitioner accepting the assumed condition as real, and waiting hours to at length be compelled to make the mortifying admission that no labor would be forthcoming.

Let an immediate examination be made. Not necessarily

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and preferably not a vaginal examination, but determine by external manipulation the existence of pregnancy, and determine also the presentation. By auscultation assure yourself of the viable condition of the fetus. Note carefully, too, the pelvic diameters and determine whether there is likely to be such a disproportion between the pelvic diameters and the fetal head as to necessitate any obstetrical operation. Any considerable deviation from normal measurements may be inferred from the external measurements, which I append. The distance between the anterior superior spines 10 inches; distance between iliac crests, 11$\frac{2}{5}$; height of posterior wall, 5$\frac{1}{5}$; anterior, 1$\frac{3}{5}$; last lumbar spine and middle of external surface of pubes, 8 inches.

Fortunately, deformed pelves are still rare in this country. Now observe the character of the pains, and determine if they are genuine labor pains, or of that spurious kind that sometimes give trouble and suffering near the termination of pregnancy.

Satisfied that pregnancy has really commenced, have an enema given, and secure a free movement of the bowels. Have another one administered that the colon and rectum may be thoroughly free from fecal matter, that there may be no soiling at a later period to annoy and to endanger the possibility of sepsis.

If possible now a warm bath, or at least a thorough washing of the external genitals with an antiseptic, or aseptic, wash. Now, clean clothes and clean bed, not too soft, no feathers—nor too hard. A thin mattress or folded quilts will suffice. Now under the sheet place a rubber blanket to protect the bed, and over this a folded sheet.

Later, when the second stage of labor is approaching, let the patient's clothing be carefully pinned up about the chest, and a sheet properly folded and enclosing a Mackintosh, or small rubber blanket, be pinned about the waist that may cover the hips and limbs, and receive all the discharges, and

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that can be removed with all debris at the termination of labor.

When you have determined by external examination, by the character of the pains present, and can judge by experience how long you can be spared, and after giving all necessary directions, then your absence is better than your presence in the lying-in chamber. You may even be absent for some considerable time, perhaps see other patients and so arrange your affairs as to be able to spend all necessary time with the lying-in woman without serious loss to others, always, however, having your whereabouts known that you may be immediately recalled if circumstances require. Always remembering that when you have accepted and assumed the care of an obstetrical case, your first obligation and duty is to that patient, and that no personal or selfish interest is to enter into your calculations for a moment. The lives of two human beings are entrusted to your care, and may be sacrificed by a moments wrong-doing, carelessness, or indifference.

Give then your whole time, thought, and attention to the care and welfare of the woman in this, the most interesting, the most wonderful, the most dangerous hours of her life. The first stage of labor begins with the accession of labor, and ends with the full dilation of the os uteri, during which there are intermittent contractions of the uterus—pains. During this stage the patient should be encouraged to continue some light employment, to walk about, or, at least, to sit up, that the force of gravity may assist in the dilatation of the os uteri and the progress of the labor. Some light nourishment should be taken and the bladder frequently relieved. The character of the pains becoming more expulsive, will indicate the approach of the second stage, and now it is wise to make a vaginal examination, that we may detect a prolapsed funis, verify our diagnosis as to presentation, etc. Any septic condition of vagina may be detected also.

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Now, the external organs being thoroughly asepticised, the hand made surgically clean and lubricated with an antiseptic soap, make a careful and thorough examination, learning, if possible, all that you will need to know, so that examination will not need repetition. If any septic discharge is encountered, let it be removed and corrected by an antiseptic vaginal douche, not of bichlorid however, for this corrugates the tissues and makes them harsh and unyielding and so disposes to lacerations. Creolin in the proportion of one-half ounce to the gallon of warm water, or a solution of carbolic acid one to forty is preferable. Simple boiled water in large quantity applied forcefully may be all-sufficient. I take it for granted, that impelled by every sense of humanity, not to say of gallantry, that you have as soon as the pains have become intense, resorted to the great blessing, chloroform. This should be given in the most careful manner to what is known as the obstetrical extent, *i. e.*, to somewhat benumb the severity of the suffering without destroying consciousness. A few whiffs of the anesthetic with the beginning of each pain, withdrawing it as soon as the pain is lessened.

There are cases where a rigid os uteri or rigid external organs may require that the remedy be pushed to the surgical degree of entire unconsciousness, and it is found that chloroform anesthesia excels all other remedies, as venesection, the use of ipecac, antimony, or other relaxants in producing that relaxation of muscular and other tissues that may delay labor. Dr. Bedford Brown in his report to the American Medical Association in 1895, says that in a long experience in the use of chloroform, extending over a period of nearly forty years, that he has yet to see his first case of the least evil result to either mother or child. That in the practice of the world there must be twenty cases where chloroform is given in parturition to one where it is used in surgery, and yet that there is not one-hundredth part of the cases of mortality in the former that are reported in the latter. That the most careful investigation has failed

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to find more than forty cases of mortality attributed to chloroform in labor in the practice of the world from the time this anesthetic was introduced to the present time. Some high authorities place the number at only three. With this wonderful showing it is criminal not to make use of this means of alleviating and preventing the unutterable pangs of childbirth. Nevertheless great care should be exercised in its administration. In the nature of things it is not possible to call in an expert to administer the anesthetic nor is it desirable to make use of a so-called inhaler.

The obstetrician should commence the exhibition of the soothing agent himself. Let him fold a soft napkin six to eight thicknesses, and place this across the palm of his hand. Holding the vial of chloroform, say two ounces, in the other hand upright, give the vial a sharp succussion upwards against the napkin pressed down firmly over the mouth of the vial—never inverting the vial holding the chloroform.

A sufficient quantity will be thrown against and absorbed by the napkin. Now hold the loaded napkin say one inch from the nostrils of the patient. A sufficient quantity of chloroform mixed with a sufficient quantity of pure air produces the effect you desire with, I believe, absolute safety.

By the time the attention of the obstetrician must be given more especially to the progress of the labor, the chloroform may be safely handed over to the most judicious woman present, who has by this time observed the manner of giving, to continue its administration under the constant eye of the physician. It is wise to resist the importunities of the sufferer for complete oblivion, for doubtless the remedy may be pushed to the extent to delay strong uterine contractions and so delay labor, but the long continued use to the degree indicated the obstetric degree is a saving of time, a saving of suffering which is humane, and is the fulfillment of our highest duty. This should be commenced in the first stage as soon as the pains become greater than any man would be expected to

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endure in any surgical case, and continued with occasional intervals till the labor is completed.

During the first stage of labor, known by the cutting character of the pains and the absence of expulsive effort, the position of the patient may be generally erect, sitting, standing or walking about. No encouragement should be given to voluntary help, holding the breath, bearing-down, etc., but when the second stage approaches there is involuntary bearing-down, holding the breath, etc. Now the position should be on the back or preferably on the left side that more efficient aid may be rendered by the obstetrician. Something should be provided for the feet to rest upon, as the foot-board of the bed, and to pull upon, as a sheet or rope fastened to the foot-board. But I have found the stirrups now provided for this purpose of great use and comfort. There is little to be done in this stage beyond close watching of the progress till the head is well advanced in the lower strait; then with the ulnar edge of the right hand resting behind the anus, press forward the advancing head under the pubes, thereby supporting and preventing rupture of the perineum, at the same time dissuading the patient from any voluntary straining and aiming to deliver the head in the interval between the pains. The left hand of the obstetrician should be resting upon the fundus of the uterus and exerting some pressure from time to time.

The head having been delivered first, see that the neck is not encircled by the cord, and if so, bring down enough of it to slip over the head and avoid danger of strangulation. There will be little trouble or danger in completing the delivery of the body. Now let your efficient help that has been handling the chloroform, place her hand in lieu of yours over the fundus of the uterus, grasping it to keep up its contractions and prevent hemorrhage, while you take care of the infant. Have with you a suitable cord and scissors, but do not tie the cord till it has ceased beating. It has been con-

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clusively proved that the new-born child will receive from the placenta about four ounces of blood if left attached to the cord till it ceases beating, and so have more needed strength. Now tie the cord two inches from the umbilicus, and also close to the vulva, sever the cord one inch from your first ligature and pass the child to the nurse for its first ablution. Care should be exercised in tying and handling and dressing the cord. Recent observations have shown the cord to be a not infrequent channel of infection in the new-born. Placing your hand upon the patient's abdomen, if the placenta is still within the uterus, the tumor is still well down in the pelvis and not readily movable from side to side. You have only to continue steady pressure, grasping as well as may be the uterus in your hand. No rough pressure is admissible, nor must the cord be pulled upon lest the uterus be inverted or the placenta be partially torn from its attachments and profuse hemorrhage be induced. Wait for the separation of the placenta when it is forced by the after-pains from its attachments and moved down into the vagina. The uterus will be felt higher, will be movable from side to side, and the cord will show the tape you have tied about it from four to six inches from the vulva. It may now be gently drawn upon and the Credé method be used to complete the delivery of the placenta. This should not be left to nature, but be completed, that the mother may have needed rest. The gentle pressure upon the uterus should be continued till the abdominal bandage is applied. Fold a napkin and apply over the abdomen, then pin with safety-pins a broad bandage extending from the pubes to the ensiform cartilage; if it be gored to a snug fit, well—if not, you can easily make it well adapted to its purpose. I speak of this because the utility of the binder has of late years been questioned. It takes the place of the hand in holding the uterus contracted, and so preventing hemorrhage, supports the relaxed abdominal muscles and keeps the desired and healthful form of the body,

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also it gives points of support for an antiseptic compress that should be at once applied over the external genitals, to be removed for urination, and frequently for cleanliness. Before the last is applied, however, make a visual examination for lacerations, and repairing any that may be found of sufficient gravity to need reparative stitching. Modesty is now in abeyance and this slight operation will be readily accepted now, to-morrow it will not, and if done to-day will be well under way of repair to-morrow.

In the mean time we may suppose the child to have been cared for by the nurse who will probably be a neighboring woman. You will have seen before handing it to the nurse that the eyes were carefully wiped from any secretions with a solution of boric acid, the throat free of mucus, and that it breathed well, if not resorting to the approved method of bringing to the delayed respiration. Do not take your leave for an hour or two lest some untoward hemorrhage or other calamity occur, and continue to visit your patient daily for several days. Make early enquiry for the condition of bowels and kidneys of each of your now patients; direct the diet and care of each; see that no alcoholic mixture finds its way to the stomachs of either, no indigestible food, and that the bowels are moved in reasonable time; for the child within the twenty-four hours, for the mother in thirty-six to forty-eight hours will be admissible, as the lower bowels have been freed before the labor.

You have now the danger of septic infection to look out for, but if the position during the third stage has been upon the back, if the uterus has been kept completely under control, and if the placenta and membranes have been completely removed there will be little danger. But if the labor has not been properly managed, by which I mean it may not have been your case, there may be foreign matter in the uterus—a portion of placenta or membranes or clots of blood—and from the third to the fifth day there will be pain, slight rigors;

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the temperature will rise to 101° or 102° F, and the pulse become rapid; inflammation supervenes and extends till we have general or local peritonitis, with death or long continued invalidism. When these symptoms begin, raise the head of the bed, that free drainage of the vagina may be promoted; give a brisk purgative and allow the patient to rise to a sitting position upon the bed-pan to more certainly free the vaginal canal of offensive matter. The high temperature continuing, douche the vagina with the creolin solution, a one per cent. solution of carbolic acid, or other efficient antiseptic wash. Let the douche be freely used, but so guard the force as not to throw fluid into the uterus. If there is failure to reduce the temperature, which usually will fall at once, then introducing a large tube thoroughly irrigate the uterine cavity twice every day.

Sustain the vital forces by tonics—all the food that will be assimilated, and by the freest use of alcoholic stimulants.

In all cases impress upon your patient the necessity of remaining a long time in bed. Explain the great weight of the uterus, the relaxed condition of ligaments and external organs, and the certainty of prolapse of uterus if labor is too early resumed; and explain too, what is true, that the woman that remains long in bed after labor, retains long her youthful looks and genteel form, with greater strength and better health.

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HOW SHALL WE TREAT ABORTIONS?

BY MARGARET CALDWELL, M. D., OF WAUKESHA.

An abortion is the death of the fetus and expulsion of the products of conception, during the first half of pregnancy. When called to attend a threatened abortion, where we are positive that expulsion must take place, what shall we do? Proceed at once to remove the contents of the uterus, or—wait? This is a question which comes to every one of us, and is so hard to answer beforehand, that whichever we do, we may be sorry we didn't do the other. Leaving the physician's anxiety of the case out of it, which is best for the patient? Let us look at the condition of things—the physical relation of the ovum to the uterus. When the impregnated ovum comes into the cavity of the uterus, two distinct physiological conditions start into existence—the preparation of the bed, or nest, for the coming child, and the growth of natural protection which surrounds the ovum independently of the nest, and is an accompaniment of all impregnated ova whether retained within the body of the mother, or whether it received its life through external heat. The first is a condition of the uterus, which seems to recognize that something extra is required of it. It becomes swollen. The vascular condition of the whole uterine muscle is so much increased, that the ocular appearance shows a purplish color. To the touch it is soft and velvety, in contradistinction to the hard feeling of a uterus increased in size from a sudden cold, or from infiltration from chronic congestion, or inflammation. In pregnancy the endometrium becomes thicker from increased vascularity, and proliferation of the mucous follicles, until the thin normal mucous membrane is changed into a thickened tissue, the decidua vera. How is it with the ovum while

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this change is going on in the uterus? The external layer, the vitelline membrane, has been receiving stimulus from the changing vitellus; the smooth homogeneous membrane has begun to thicken, to become vascular, to throw out prolongations, or feelers for some support, where it may find a resting place, and also absorb nourishment while its contents are being transformed into a living animal. These two independent tissues, the chorion of the ovum, and the decidua vera of the uterus, might be compared to two mattresses which united form a safe lodgement for the growth of the fetus. From their close apposition and similarity of structure, they dovetail into each other by their proliferating surfaces, join hands, to make the best, safest, and most nourishing structure, for the perfect development of the ovum. When an abortion takes place what is it that occurs? There is a separation of the ovum from the uterus, and this separation must take place in the decidua vera, and not in the chorion, nor between the two. If the sac containing the ovum comes away clean with little or no hemorrhage, the probabilities are, that both chorion and decidua vera are left behind. If a very thin, raw surface surrounds the sac, the chorion may have adhered tightly to the ovum, and the decidua is still *in situ;* with these conditions there is not much hemorrhage, the bleeding will likely be constant and gradual; but if the decidua is adherent to the ovum, the hemorrhage in spurts, with or without pain, it is decidedly more dangerous for the patient during the separation of the tissues, and requires a quick decision on the part of the physician, to know what is best to do. Here are three classes of abortions. How shall we treat them? Always keeping in mind what is best for the patient. So far as the physician is concerned, it is decidedly easier to remove the contents of the uterus at once, with or without the curette under an anesthetic. But is that best? I must return thanks to one of my confreres for his experience on this subject, one

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whose practice is both large and successful in cases of pregnancy. My own experience coincides with his, that in all cases, but especially the first two classes, where bleeding is not dangerous, where there is no fever, the patient often not confined to the bed, that the expectant treatment is the best; and even in the last class, when the patient can be seen without delay, if dangerous symptoms supervene,—I refer to hemorrhage,—it is better for the patient to let nature make the entire separation, than to forcibly tear them apart. After separation has taken place, the uterus often refuses to expel the dead tissue, when it should be taken away at once. If the patient is nervous or weak from pain or fright attending her condition, and the debris cannot be removed easily, an anesthetic should always be given; it prevents her losing entire control of her nervous system, and saves her a good deal of strength. I recall one case in which I was called in consultation by Dr. Sharp, a neighboring physician. The abortion was produced by the patient. She had some fever, less than 103°F. She had lost considerable blood, and, on account of weakness, we decided to clean out the uterus without an anesthetic, especially as she begged so hard not to have one given. The cervix was hard and had to be dilated before the finger could be introduced. Before doing all we wished, the patient was taken with a chill, and as soon as we could place her in bed and attend to her immediate comfort, we found the temperature 106½°F; clearly a chill and fever of nervous origin, as we sometimes have following an intra-uterine douche. Although this is not the place to introduce a foreign subject, I would like to tell you the result. The patient died, that is she became unconscious; her respirations grew shorter and fewer, and finally ceased. She was as dead as many other patients I have watched die, and would have remained dead if I had been alone with her. I called the attending physician who immediately inserted his finger into the rectum, drew it down steadily, and let it slip off the point of his finger with a jerk.

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After two or three such movements, she gasped when the anus slipped off the finger, pretty soon she gasped with each jerk, and in a half hour had regained consciousness and speech, and made an uninterrupted recovery. Had she been given an anesthetic she would have suffered no loss of nerve-force, and escaped the chill and fever. While preparing this paper, I was called to a patient who had lost the fetus a month before. The husband told a doctor about it, but the patient was not seen by a physician, and did not go to bed. When I saw her she had been taken off the train, where she had been for eleven hours, and was exsanguinated. The motion of the cars had brought on hemorrhage. She had had no pain at any time. I had no trouble in introducing the finger, and with one sweep separated and removed a three months placenta. No anesthetic was used. I trusted to luck in simply washing my hands before introduction. Reaction from the loss of blood took place in two hours, and she made a quick recovery. She had done all her house-work, including the care of three children, and although she had had an intermittent sanious discharge, she had no idea of her condition. I do not consider a month, as in this case, a reasonable time, but think something might have been done for her, to stimulate the uterus to action, had she employed a physician when she lost the fetus. One of the reasons so many women base years of invalidism on an abortion, is because more attention is needed after the expulsion of the ovum, than during the time. Most physicians and most women think, if the contents of the uterus have passed, she is all right; nothing further is needed, and indeed, the practice is, to leave her bed many days sooner than she would do if she were delivered at term; but the the truth is, she needs medical advice much more after the abortion than after labor. The fruit was not ripe, and the uterus does not, nor can not, return to its normal condition in the same length of time. The condition is not so much the result of the abortion, as the cause of

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it. A latent inflammation, metritis or endometritis may exist throughout a successful pregnancy and labor, but more often it causes the arrest of development. It is a recognized fact that a patient who aborts, is much more liable to a second abortion, at the same period of pregnancy, than the woman who has not had an abortion; and the reason is, that the uterus is diseased and should be brought into a healthier condition, before another conception. The fad of curetting the uterus during or following an abortion, is I think one great cause of endometritis. I have yet to see the case of abortion that could not be all cleaned away by a sweep of the finger around the interior of the uterus; the more severe the pain and hemorrhage the easier to accomplish, as the cervix is apt to be sufficiently opened to admit the finger, without instrumental dilation. If the cervix is hard and unyielding, and dangerous symptoms are present, an anesthetic will relax the rigidity; but, if no dangerous symptoms call for immediate interference, then the after-condition of that uterus will be more desirable if a reasonable time is given it to do the work of separation and expulsion, and there will be no tissues to recover from the indispensable bruising. We do not forcibly separate tissues in other parts of the body when disease attacks them; we wait for nature to do what she can to accomplish the work, and then if she is not successful, we aid her gently and carefully. Then let us treat the tender tissues of the uterus as we would the external tissues, and if ever that form of medication known as "local treatment" is allowable, it is after an abortion.

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THE MIDWIFERY QUESTION.

BY J. NOER, M. D., OF STOUGHTON.

In the law recently enacted by our state legislature requiring certain educational and professional qualifications for medical practitioners, no provision was made for the practitioners of obstetrics, or rather they were exempted from the responsibility of showing any qualification whatever for their particular department of medical science. The omission was made because such a provision would have endangered the passage of the bill. It seems that many people, who are otherwise quite rational and intelligent, regard the practice of obstetrics as properly relegated to the "Kerry Quales who are forty or more, and all but blind custom must be indulged in custom, or custom will weep."

Our nineteenth century civilization is not greatly in advance of the days of Kerry Quale on the question of obstetrics, and many of the most intelligent people still regard midwifery as a sort of nursery work for a person of moderate intelligence who has passed the middle meridian of life.

But what can we do to improve this state of affairs? Will a state law which requires that all obstetric practitioners shall, before being allowed to practice in this State, be required to pass an examination based upon a definite course of theoretic and practical study of anatomy, physiology, hygiene, and the practical science of midwifery, correct the evil?

A number of distinguished obstetricians have recently gone on record in opposition to an official recognition of midwives. Henry J. Garrigues says:[1] "The institution of midwives is a remnant of barbarous times, a blot on our civilization, which ought to be wiped out as soon as possible. Since they never

[1] Address before the New York Academy of Medicine, January 27, 1898.

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have been recognized by the State, except in a few minor instances, the attainment of such an object ought not to be difficult; but since they have been tolerated it would be necessary for the legislature to enact a law declaring that only licensed physicians shall have the right to practice obstetrics."

Many other leading obstetricians take essentially the same view. They claim, and with good reason, that there is such a surplus of physicians, that there would be no difficulty in obtaining medical aid at a moderate fee for every child-birth in the United States.

There are, says Garrigues, only 15,742,636 women (last census) of child-bearing age in the United States. There are 104,805 physicians and surgeons in the United States, which gives one physician for every 105 women of child-bearing age; but women do not bear children every year. Quite the contrary. We may estimate even by a liberal calculation that in America they, on the average, only give birth to four children in all; consequently the number of women in the child-bearing period must be divided by eight in order to find the average number of births per annum, which gives about nineteen confinements every year for each physician in the United States.

No one will contend that physicians cannot easily attend to this number of confinement cases. This argument is very plausible, and would appear to indicate that the midwife ought to be relegated to the rear as a relic of barbarism. In the west where the population, as in Wisconsin, is largely German and Scandinavian, the census report given by Dr. Garrigues will not hold true. The average German and Scandinavian family will be nearer eight than four. Let families of this sort be located in rural communities, where there are no free dispensaries, and doctors are to be had only at a distance of from two to ten miles, and it will be seen that we have a condition of things entirely different from that which exists in the east.

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We have here a condition of things in which the educated midwife is an aid, not only to the people, but to the physician also. The foreign population are, as a rule, in the habit of employing midwives, hence do not take kindly to the idea of being legally compelled to employ a physician.

While it is, as a rule, true that physicians are better qualified to conduct cases of labor, it is not so certain that recent graduates would be safer conductors for an ordinary case of labor, than would be a midwife who had been trained only for her special work. We all know that the main thing to do in a normal labor is to see to it that the rules of asepsis are observed, and to support the patient with our courage and sympathy. A midwife who has had the benefit of theoretic and practical training in her specialty which enables her to recognize malpositions and other serious complications, and who is not legally permitted to use forceps or do any obstetric operation, is likely to call medical help in time of danger. Such a person is likely to be an aid in bringing about a rational and progressive spirit in the domain of obstetrics among the common people.

As it is, the ignorance, the superstition, and the filth which prevail among a large class of the community, is intensified by the filthy and ignorant midwives, who are the regular attendants of this class of people. While I recognize as true that obstetrics is a department of medical science, fully as important as is gynecology, or, if you please, opthalmology, yet I do not believe that our population is sufficiently enlightened on this subject to recognize this truth.

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ECLAMPSIA AS AN INDICATION FOR THE INDUCTION OF PREMATURE LABOR—AND THE BEST METHOD OF PERFORMING THE OPERATION.

BY M. R. HEWITT. M. D., OF MILWAUKEE.

In selecting this subject I do not expect to advance anything new, but to bring before this Society a subject for discussion; which is the best course for the physician to pursue in the class of cases under considerations? Owing to the diversity of opinion among experienced obstetricians it is not wise to make an absolute statement in regard to this operation. To reach an approximately accurate conclusion it will be necessary to sharply differentiate the instances where eclampsia seems imminent, and those cases where convulsions have developed. Albuminuria is an almost constant forerunner and accompaniment of eclampsia, at least that is the rule with but few exceptions. The albuminuria may or may not depend upon organic renal disease. The question which the physician has to face is immediate risk to mother and child if pregnancy be allowed to go to term, remembering that in no given case can it be predicted that the emptying of the uterus will ward off convulsions.

In the majority of cases the development of eclampsia leads to premature labor. If we follow nature's teachings then it seems wise in the presence of eclampsia to resort to such measures as will hasten the emptying of the uterus instead of such as will protract the gestation. The latter course, certainly, will avail naught to the child, for its life is endangered by the first eclamptic attack, and, should it survive this and labor not occur spontaneously, its chances of living through further attacks are all the less. Regarding the mother, if spontaneous premature labor do not occur dur-

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ing the first attack, experience teaches that the liability to further attacks is greater if the uterus has not been emptied than when it has; the first attack exhausts the woman; the second attack adds to the exhaustion and may kill. Therefore, in the presence of eclampsia it may be stated that nothing is gained by delay and everything may be lost.

As I have stated that the induction of labor for the prevention of eclampsia is opposed by some obstetric authorities, its wisdom, however, either as a prophylactic or a curative measure, can scarcely be questioned when other therapeutic measures have failed. When convulsions are imminent there is even greater diversity of opinion as to the advisability of inducing labor. While apparently imminent they may never occur; the induction of premature labor may not ward them off; indeed the measures necessary for induction may provoke convulsions. In the face of this fair statement what ground is there for advocating the operation? Supposing that, in spite of the usual treatment of albuminuria, an absolute milk-diet combined with iron, the albumen increases in amount, headache and visual disturbances appear, dropsy to a greater or less degree sets in, the woman has reached the seventh or eight month; the child is viable, the fetal heart certifies that it is alive. The chances are that this woman will have eclampsia before or at term, during labor or afterward. If she do before the onset or the completion of labor, the child's chances of survival are very slight. Meantime the woman risks aggravation in the renal symptoms and conditions, disturbances of vision more or less permanent, puerperal mania, and puerperal paralysis.

Now, if the operation of inducing labor be elected at the period under consideration, the child's chances are better even if, as the result of the operation, eclampsia is induced. As for the woman, medical and dietetic treatment having failed to arrest the progress of the albuminuria, the induction of premature labor may save her the complications just enumer-

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ated, to any and all of which she is liable if the pregnancy be allowed to go to term. Therefore the immediate and remote welfare of the woman calls for the induction of premature labor in instances where the development of eclampsia is feared.

Modern opinion is tending toward the acceptance of this view. Lusk protested against postponing resort to the induction of premature labor until the grave symptoms (chiefly cerebral) which precede eclampsia develop.

In determining the best method for performing the operation, the fact must never be lost sight of that the intent of the operation will be to save the woman the greater risk she suffers if allowed to go to term, and also to obtain a living child. To satisfy this intent the operation, when election is possible, should be postponed to as near term as is consistent with the interest of the mother, for thus the chances of the infant's life are increased.

In selecting the method for inducing premature labor no method should be selected which carries with it strong probability of magnifying the chance of error as to time, such a method is not fair to the child; neither under other indications is it fair to the woman. If eclampsia threaten, for instance, and the physician determines that labor should be induced, he cannot afford to place dependence upon a method which may not prove effective for days. I will only mention a few of the methods commonly used:

1. Puncture of the membranes will certainly induce labor, and when aseptically performed may be ranked as safe for the woman. But the method does not imitate nature's method and may imperil the child. In the course of normal labor premature rupture of the membranes invariably leads to tedious labor, and this may entail both maternal and fetal exhaustion. The object should be to maintain the membranes intact in order to avoid a protracted first stage of labor.

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Therefore puncture of the membranes should not be considered.

2. Tamponing the vagina. There exists but one indication under which the tampon might fill a place, and that is in the the event of premature labor being indicated by hemorrhage.

3. Injection of glycerin for the induction of premature labor. Glycerin when injected into the uterine between the membranes and the uterine wall, acts by causing exosmosis from the amniotic sac. There is profuse secretion of fluid from the uterus, and uterine contractions set in. Uterine contractions should be evoked in the course of a few hours, otherwise the procedure will have to be repeated. The objection to the method is that it is uncertain in its actions, and when the indication is an urgent one the physician is not justified in taking the chances of failure.

4. The insertion of an English catheter or elastic bougie between the membranes and uterine walls. This method is probably resorted to more frequently than any other. The method is safe to the mother provided proper asepsis accompany the insertion of the instrument. This, also, has its objections. In the first place it may not induce labor for some days, and possibly not at all. When the emergency calling for the operation is not an urgent one this method will answer very well. In case of urgency, however, it must be supplemented by a step further.

5. Dilatation of the cervix as a means of inducing premature labor. With this method as a working plan, labor may be induced and completed within a short time with less risk to the woman and child than by any other method. This method consists first in rendering the external genitals and vagina thoroughly aseptic; the woman is placed in the left lateroprone position, and the cervix is exposed through a speculum. The tenaculum is inserted into the anterior lip of the cervix to steady the uterus, the cervical canal is dilated to

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the extent of half an inch by the steel-branched dilator. This may not be necessary owing to the softened condition of the parts at this period. Then, taking a strip of sterilized gauze two yards long by two inches in width, the bladder having been previously emptied, the sterilized gauze is grasped by the dressing forceps and carried into the cervix up to and not beyond the internal os. The cervical canal is packed full and the remainder of the gauze is used to tampon the upper vagina. The object of the gauze is two-fold; it will, in all probability, excite uterine contraction, but, if it do not, it dilates the cervix to a sufficient degree to enable the operator to resort to the next step. The aim of the step to which we now pass is to secure full dilatation of the cervix to enable the physician to resort to version, the conditions being favorable for the operation. According to whether the indications for interference be urgent or not, the physician may elect one of two procedures: the first, in case the delay of a few hours seems allowable; the second, if delivery is necessary within a brief space of time. The first method consists in the use of Barnes' hydrostatic bags; the second depends upon the use of the hand. If uterine contractions are present, the attempt at insertion of the bag should be made in the interval of the contractions, in order not to rupture the membranes. This method will not answer if the case is urgent. Here time is an important factor, therefore we should proceed to use the second method, which consists in putting the patient deeply under an anesthetic; the hand is introduced into the vagina and the index finger is inserted into the cervical canal; a steady pressure is maintained and shortly it will be found that we can insert the second finger, and so on, until the cervix is completely dilated, then perform version and deliver as rapidly as possible. This method should only be used in cases of emergency. This has been my method of managing this class of cases for the last few years and the results have been such as to warrant its adoption in cases where eclampsia is threatened.

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INVERSION OF THE PUERPERAL UTERUS.

BY JOHN T. SCOLLARD, M. D., OF MILWAUKEE.

Professor of Obstetrics, Wisconsin College of Physicians and Surgeons, Milwaukee; Medical Director, Maternity Hospital.

Inversion of the puerperal uterus consists in the substitution of the inner for the outer surface of the organ, and may be complete or incomplete, and the latter may exist in various degrees. With complete inversion there may also exist an inversion of the vagina with prolapse, which may allow the inverted uterus to escape from the vulva. In the partial or incomplete form the body of the uterus is partly inverted, or the body may be wholly inverted, but not the cervix. In the complete variety the corpus and cervix are both inverted.

Causes.—1. Predisposition. Gustav Braun observed spontaneous inversion twice in the same woman after delivery of the placenta, which would seem to indicate a predisposition in some uteri to become inverted with no other apparent exciting cause. This may be aided by pressure of the intestines from above, as pointed out by Büchler, the uterus being in a condition of extreme flaccidity until the beginning of the inversion is thus established, which becomes *active inversion* according to Duncan and Spiegelberg, when the uninverted portions contract and propel the inverted portion downward. In a case reported by I. E. Taylor[17], there appeared to be a continuous, persistent contraction of the corpus and fundus uteri which seemed to unfold the cervix from below upward, thus apparently first inverting the cervix, which allowed the body and fundus to pass downward through the cervical canal, and thus the entire organ become inverted. 2. Atony of the uterine muscle may be the underlying cause either with or without predisposition, which allows a sinking in or cupping of the fundus or a portion of the corpus uteri; associated with

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this atony of the uterus is, 3. Irregular contraction of the fundus, forming a contraction ring around such cup-shaped depression, which forces the relaxed portion in the direction of the uterine cavity and cervical canal. As directly aiding this process of inversion thus established, a fourth causative factor often comes into play, viz.: traction on the cord before complete separation of the placenta; this cause may follow those already mentioned, or it may simply be associated with atony of the uterine muscle, without which as a precedent condition traction on the cord cannot produce uterine inversion. Cases of complete inversion from this cause are reported by Crommelin[1], by A. Boodle[2] and by Hirst in 1893. Traction upon a short cord, though unavoidable during delivery, has produced inversion in a case reported by W. Hutchinson in which the cord was 23 centimeters in length.

Time of occurrence.—Inversion of the puerperal uterus may occur immediately at the end of the second stage as in the cases reported in 1888 by Arthur Jefferson[11], by N. Guhman[12], and by Walter Hutchinson in 1890. In Gustav Braun's cases it occurred after delivery of the placenta, while in a case reported by Carlo Decio[7] in which delivery was instrumental, accompanied by severe hemorrhage, inversion occurred after eight days and was followed by septicemia. Inversion may also occur after posthumous delivery as in a case reported by Isaac E. Taylor[17]. But the most frequent time of occurrence in reported cases is at the end of the second stage of labor during some form of effort to deliver the placenta or when the cord is unusually short. There may also be a recurrence of the inversion after complete reduction as in the case of W. Huber[15], which afterward terminated fatally from metritis and septic infection (peritonitis).

Symptoms.—The chief symptoms of complete uterine inversion are (1) Collapse, and (2) Hemorrhage. The woman suddenly becomes blanched, the surface of the body cold,

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with clammy perspiration, gasping respiration, she complains of darkness before the eyes, the pulse becomes extremely weak, very rapid or imperceptible, sudden and profuse loss of blood occurs; this hemorrhage may come in spurts owing to the gradual turning out of the organ or to the alternate relaxation and contraction of the cervical ring, through which the fundus and corpus uteri have already made their escape; thus there may be repeated hemorrhages. This will not occur in cases in which the inversion is not preceded or accompanied by detachment of the placenta.

Dangers.—Inversion may be attended by shock and hemorrhage, either of which may prove fatal as in cases reported by Bissett[4]. The imprisoned portion if left unreduced may slough off from strangulation. Infection may occur from careless manipulation, or accidentally as in a case reported by Noble[5], which developed tetanus on the seventh day, dying on the tenth day. The inversion is liable to recur after reduction as in a case reported by Gordon[8]. Occasionally there may occur strangulation of intestinal loops in the cervical contraction ring as in a case related by Girard. Acute anemia of dangerous type may result, as in a case reported by A. Bergman[16], which was overcome by injection of normal salt-solution.

Frequency.—There are no conclusive statistics as to the frequency of its occurrence. Winckel in over 20,000 labors had not seen a case of complete inversion. Denham saw but one case in some 18,000 labors in the Rotunda Hospital. Still Kehrer states it as probable that inversion occurs once in 2,000 labors. It is probably more frequent than formerly supposed.

Complications.—Intestinal complications may prove fatal as in the case reported by Newton Benson[6] which had been easily reduced. Prolapsus of the inverted uterus, more or less complete, favors hemorrhage and sepsis and renders reduction more difficult, as in Huber's[15] case. Into the funnel-

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shaped cavity formed above by the inversion of the fundus lined by peritoneum, may enter the Fallopian tubes, the ovaries, the ovarian, round, and broad ligaments and portions of the intestines or omentum. The walls of this funnel-shaped opening may grow together, including these appendages and structures named, and prevent their removal and also the proper reduction of the inversion. Such a case is reported by Svenson[18] in which he amputated the uterus after three months, and found both ovaries, tubes and broad ligaments.

Diagnosis.—The diagnosis is easily made if the placenta is still attached. If the placenta is completely detached, the inverted uterus has been mistaken (1) for the head of another child, (2) for the placenta itself, (3) for a polypus. The following points will establish the diagnosis: 1. The fundus cannot be felt through the abdominal walls. 2. A cup-shaped depression may be felt in place of the fundus. 3. A tumor is found in the vagina, with a groove around its insertion which is central, while in case of polypus, insertion is lateral. 4. The mucous membrane of the inverted uterus is sensitive, while that of a polypus is not. 5. Where prolapse of the uterus and vagnia has taken place, a tumor is found at the vulva. Of course, where the inverted organ is found outside the vulva the diagnosis is made, but in cases in which such prolapse has not occurred, the diagnostic points must be carefully considered to avoid possible error.

Treatment.—This must consist in prompt reduction of the inversion under as thorough asepsis as possible. The necessarily extensive manipulation renders this of extreme importance. Spontaneous reduction of the completely inverted uterus has been observed by Spiegelberg, Büchler, Thatcher, Meigs, and Shaw. The reduction is best accomplished by reversing the process by which inversion occurred, that is by returning first the parts which came down last; hence the entire inverted portion is gasped as firmly as possible and pushed upward, alternating the pressure first on one side then

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on the other, thus reinverting first the cervix, then the lower uterine segment, the corpus and fundus uteri, the entire organ being thus returned to its normal position in the reverse order to that in which it was inverted. If the reduction is prevented by spasm of the lower uterine segment, we may wait for it to relax if no serious hemorrhage is taking place, otherwise it may be necessary to tampon, and anesthetize the patient to cause the spasm to relax, when the reduction may be accomplished. To prevent recurrence, intra-uterine irrigation with some hot antiseptic solution should be practiced. The reduction by taxis as described, aided and accompanied by hot irrigation during the reduction, was practiced in a case reported by Geo. E. Fell[14] in 1890.

Reduction under hypnotic suggestion was practiced by A. Bergman[16].

Report of case.—On June 27, 1897, I was called to attend Mrs. B.—— a primipara.

The woman was strong, healthy, about twenty-four years old, and had been in labor eighteen hours before I saw her at the end of the first stage. I found a vertex presentation in first position. In an hour the membranes had ruptured and the case was fully in the second stage, when she began to show signs of exhaustion, and begged for relief. This I gave her with chloroform-anesthesia and instrumental delivery, which was exceedingly difficult, occupying one hour, but being successfully accomplished, with a living child and no laceration. The placenta was expressed in fifteen minutes; the uterus contracted well and maintained its contraction, being carefully watched for nearly an hour, when it was left for a few minutes to attend to dressing the baby's navel. Suddenly the woman began to gasp and said to her mother, "I am dying." Coming quickly to the bed-side I found her in collapse with severe hemorrhage; and a rapid examination showed me her condition, the uterus absent above the pubes,

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a large tumor in the vagina. The woman was now unconscious from loss of blood, and what was to be done must be done quickly. I applied taxis as before described with counter-pressure above and in a few minutes accomplished the reduction. The uterus, however, failed to contract, remaining relaxed and flabby, and on withdrawing my hand the inversion seemed about to recur. Intra-uterine irrigation with hot sterilized water was immediately done, the hand being kept in the uterine cavity until firm contraction, which occurred very quickly on the introduction of the hot water. The patient was still in collapse, unconscious and in a condition of acute anemia. To overcome this latter condition a large quantity of sterile normal salt-solution was thrown into the rectum and descending colon, and a considerable quantity —about a pint—injected subcutaneously, as well as hypodermatic injections of strychnin being given. After five hours work, I had the satisfaction of seeing the patient regain consciousness, after which she made an uninterrupted recovery. She is in good health at the present time. In this case the uterus was entirely empty, had contracted well, and maintained its contraction for nearly an hour, during which time it was carefully watched. I have attributed its sudden relaxation and inversion, to the exhaustion of the uterine muscle due to the prolonged labor, difficult artificial delivery, but still more to the action of the chloroform upon its ganglia, and consequently upon its nerve-supply, this disturbance of the nerve-force causing relaxation or inertia of the lower uterine segment and irregular contractions which produced the inversion.

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THE CAUSE, PREVENTION AND TREATMENT OF PUERPERAL INFECTION.

BY J. J. M'GOVERN, M. D., OF MILWAUKEE.

Two classes of subjects are always difficult to treat: One where new fields are being explored, where pioneer work, if you please, is being done; the other, where the ground has been already so completely covered that new discoveries are either impossible or are added slowly. The subject of this paper belongs to the second of these groups. Few other topics have in the past so widely engaged the thought of writers upon medical themes or received from them more careful treatment. Indeed very little of value has been added to the discussion of this subject since the year 1843, when Dr. Oliver Wendell Holmes wrote the essay which has since become classic.

The term puerperal infection denotes any diseased condition produced by infection during childbirth at any stage of gestation. The causes of puerperal infection are two-fold—predisposing and exciting. The predisposing causes are: First, the retrograde metamorphoses which takes place in the blood and uterus after the expulsion of the fetus; second, lessened resistance due to loss of blood, pain, and nervous strain; third, an open placental site with blood-clots which serve as a field for the growth of germs and as an absorbing surface; fourth, lacerations or wounds of the birth-canal; fifth, the lochial discharge with debris, which answers as a culture medium for micro-organisms.

The exciting causes of this unfortunate disease are the growth of bacteria in living or dead tissue in the birth-canal and the absorption of the toxines or ptomaines produced by this growth or the entrance of both poisons and germs into the circulation, and their spread to various parts of the body.

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The micro-organisms most commonly found are the streptococcus, staphylococcus, Klebs-Loeffler bacillus, and putrefactive bacteria. The usual way in which the poison reaches the patient is through doctors, midwives, or nurses who deposit it in the genital canal during examinations and manipulations. Sometimes patients are infected from poison previously deposited in the birth-canal. That a patient may also be infected from the air is now admitted by the best authorities.

Two questions of the greatest importance should be constantly before the mind of the obstetrician. The first is how to prevent infection and the second, how best to treat patients suffering from infection. Before the era of bacteriology a large percentage of all cases treated in lying-in hospitals had puerperal infection, and frequent epidemics in private practice were not looked upon as strange. Since the cause of this dreaded disease has been ascertained, and what steps are necessary to guard against it, the mortality in this class of cases has dropped from ten or twelve per cent. to a fraction of one per cent., or as we find in some hospitals has gone down to zero.

The best means of preventing infection is by thorough and constant antisepsis of hands, instruments, and, in fact, everything that can carry bacteria to the patient. The hands should first be scrubbed with soap and nail-brush, the nails carefully cleaned, and before examining the patient at any and all times, the hands and arms should be soaked in a 1 to 2,000 solution of bichlorid of mercury. Instruments, syringes, pads, and cloths should be boiled before using. None but boiled water should be employed to irrigate the uterus or vagina.

Hirst reports two cases of tetanus arising from the use of non-sterilized city water to irrigate the uterus following an instrumental delivery. The intra-uterine or vaginal douche after confinement is to be used only when instruments or

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hands were necessary to aid delivery. Before labor the patient should first receive a sponge-bath, and the thighs and genitals should be washed with a 2 per cent. solution of creolin, or a 1 to 3,000 solution of bichlorid. Whether a vaginal douche should be given or not before labor in every case is a mooted question at the present time. In hospital practice probably it is best to give the douche in most cases; while in private practice it is better to use it only in cases where there is danger of autoinfection, and omit it in all other cases. At the Preston Retreat in Philadelphia, where the douche is used as a routine before labor, Dr. Norris reports 2,000 consecutive cases of confinement without a death from infection. The tendency in the large maternities of Europe is to discontinue the use of the douche except when especially indicated. The placenta should be delivered, if possible, by the Credé method without the assistance of fingers in the vagina. Great care should be taken to isolate the patient from infected or infectious persons, places, or things. Decomposing organic material in the vicinity of the house is a menace, and should be removed, and an abundant supply of fresh air should be provided.

In this short paper I shall not touch upon the symptoms or pathology of this disease, but will take up the more important topic of treatment. When sepsis is suspected in any case the first thing to be done is to empty the uterus and irrigate with a two per cent. solution of creolin or lysol. The vagina and vulva should be scrubbed and disinfected before entering the uterus. The vagina should be thoroughly inspected to make certain that the focus of infection is not an ulcer, which most commonly is found in the upper posterior wall. Dr. Norris reports two cases of septicemia from vaginal ulcers in which he performed a hysterectomy, and in each case the uterus was found to be comparatively healthy, the true seat of the disease being disclosed at the *post-mortem*. In cleaning out the uterus the curet

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should be used with caution, for it may do more harm than good. The removal of protecting granulations where septic material is in close proximity to the raw surface is always attended with danger. After the third month of gestation the dull curet should be used. If the uterus is thoroughly emptied in the first cleaning, which can be accurately ascertained by the finger, it is better to depend on irrigation during the after-treatment. Ulcers in the vagina should be cauterized with stearate or chlorid of zinc, carbolic, or nitric acids.

If this method of treatment is commenced early, nearly every case will recover. If it is not followed promptly by marked improvement, stimulants as strychnin, digitalis, and whisky should be administered. Opium should be given freely for the pain, particularly in pelvic peritonitis, with mild catharsis, and nourishing food. The fever should be controlled by the cold bath or pack. Seventy-five per cent. of all cases recover under the antiseptic-supporting treatment, but with the remaining twenty-five per cent. the infection appears to be so violent or the body-resistance so low that the disease advances regardless of every effort to stay its progress. When the trouble is confined to the uterus, the removal of that organ may save the patient's life. Baldy reports several cases of successful operation for uterine thrombo-phlebitis. But if the disease has passed beyond the possibility of an operation, or when a superficial focus threatens to destroy life rapidly, as with diphtheria or erysipelas, we must turn to some way of combating the disease-germs. This can be very successfully carried out in a great many cases by the use of dipththeria antitoxin, streptococcus antitoxin, or by nuclein. The history of the use of diphtheria antitoxin is that the improvement and recovery of the patient are as rapid in cases of mixed infection as in cases of simple, true diphtheria, a fact which suggests that diphtheria antitoxin may be antitoxic to more than the Klebs-Loeffler bacil-

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lus. Indeed its use has been followed by prompt recovery in every case reported, which is in marked contrast to the success of the streptococcus antitoxin.

With this some cases become suddenly worse and die within a few hours, while others show marked improvement. The favorable cases appear to be only infected with the streptococcus, or show distinct symptoms of erysipelas. In one case of extensive thrombo-phlebitis in my practice with infected embolus in the right lung, streptococcus antitoxin was used. At first the injections were followed by general improvement, but after about four or five days they were only followed by depression. The disease did not spread after the injections were given, and there was very little pus formed, but there was very extensive parenchymatous degeneration of all of the organs, or, probably more correctly, degeneration of all of the tissues. This, I believe, is the greatest danger in the use of this antitoxin.

Nuclein has been reported favorably upon in several cases. Its administration is not attended with the dangers of the antitoxins. By increasing the resisting power of the body it is an addition to the old supporting treatment and may be used freely and for a long time without danger.

DISCUSSION.

Dr. Reynolds: I want say a few words only, about the micro-organism in midwifery. I practised midwifery for about thirty years before we knew anything about them—never heard of such a thing, and never heard anything about uterine disinfectants after confinement. In all that time I think I had hundreds, probably thousands of cases. I came to this country in 1848 when it was just settling up, and I had been practising in a similar country for three or four years before. During all that time I had, as a report made to this Society some thirty years ago will show, a record, I think, of over 200—it seems to me now it was 280 cases—

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with but two cases of puerperal septicemia, or puerperal fever as we called it then. I never introduced or used any antiseptic, or aseptic, except a little oil to examine the patient in the first stage. Now if these micro-organisms have induced such great susceptibility to infection, it seems to me that it is very unfortunate that we ever discovered them. Two cases in 280 is all that I reported at that time, and it is a fact that I see and hear of more septicemia now-a-days than I ever discovered then. More deaths occur to-day than there did forty-five years ago, proportionately, in midwifery. I do not know how it is—may be our ladies now are more susceptible to these micro-organisms—I don't know, but they were not so afflicted at that time. My practice was with rich and poor. It has been country or a semi-country practice from beginning to end, and I seldom visited a patient the second time after confinement or considered it necessury. Now we have got in the habit of seeing them a day or two after confinement. We never attended them daily for weeks, and made a bill of $50 or $100, as is recommended by a gentleman here. Old practitioners, I guess don't do it now, unless perhaps in cities. Well, with all that experience I am very skeptical about a great many things that I would be condemned for not doing now. We never gave a vaginal injection after confinement, nor before confinement unless something induced us to do so, some solution of continuity in the organ, or something of that kind, but the practice with many now is very different. There is something wrong somewhere. There is something in modern midwifery that we knew nothing about then, and we did not have to know it. I think I remember seeing in a New York journal, many years ago, a report of several thousand deliveries without a death from septicemia.

Dr. Jackson: My experience as regards obstetrics has not been very extensive , but such as it is I feel that it requires me to say a word in the presence of so many young men, who sometimes look to older men for advice. I have seen per-

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haps half a dozen women after confinement who were ill with septic infection. Now all, or most of those women have died, and at this stage of the proceeding I consider that those persons were unnecessarily lost. Antiseptic surgery and midwifery, and all that goes under the name of antisepsis and asepsis is not a disputable thing now. It is a well attested fact, and I think that the voice of this Society should go forward to all of the younger men, and encourage them, not perhaps to lay too great stress on some man's particular pet formula, but that they should go out with an antiseptical conscience and antisepsic methods. There are various terms having slightly different meaning, but the idea is that infectious disease almost without any exception, is due to the action of micro-organisms introduced from the outside; that there is a conflict going on between the cells of the human body and agents external with mutual struggle for existence; and that we have the means within our power of preventing their activities and of destroying them. I think one of the greatest triumphs of medicine to-day, that links itself alongside of all the great advances in surgery and medicine from time immemorial, is the fact that this great principle is demonstrated and practically conceded. It is a waste of time to argue the question. It should be enforced, as I said, as a matter of conviction and as a matter of duty.

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INFANT FEEDING.

BY A. W. KRATZSCH, M. D., OF CASCADE.

Among the different causes of infantile disease and therefore of infantile mortality none perhaps figures more prominently than improper feeding. This does not necessarily imply that an infant be deprived of its natural food by nursing its mother.

An infant may receive good wholesome milk from a perfectly healthy mother and yet be improperly fed. When the mother has sufficiently rested from the hardships and fatigue of labor her infant should be applied to the breast. This will be from four to six hours after labor, and as a rule the breasts contain a small amount of milk, enough to satisfy the child at this time. The full amount of milk does not appear until the third day after birth, but its appearance is hastened by repeated nursing on the first and second day. If nature intended the infant should have more food during its first few days of life, this period of scanty milk secretion would certainly be absent.

Still if the infant shows signs of thirst or is quite uneasy, it may be given a little water, a little milk and water (one part of milk to six of water), or, if very noisy, a little good brandy very largely diluted with water.

The stomach of a new-born child holds but little and it is therefore necessary to feed it very frequently during its first month of life. It should nurse every one and one-half to two hours during the daytime and every three to four hours during the night.

As the child grows older this interval between feeding should be lengthened so that at the age of six months nursing will take place about every four hours, and small quantities of artificial food given several times a day.

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The time devoted to each nursing should not exceed twenty minutes and should be followed by a thorough washing of the nipples.

A pernicious habit indulged in by many mothers is that of nursing their babies the moment they cry or become restless. Still others train their infants to nurse all night, claiming that by so doing both they and their babies rest much better.

These habits are to be discouraged, for they violate all rules of regularity about feeding, and in most cases develop an indigestion with all its accompanying disorders.

There is no fixed age at which infants should be weaned, and some mothers are known to suckle their babies until they are three years of age and older.

The appearance of the canine teeth at about the fifteenth to the twentieth month is an indication of the child's ability to masticate soft food, and weaning may be begun. Weaning should not be done abruptly, so as to force a sudden change of diet upon the child. It should be taught to be fed with a spoon from time to time during the daytime and nurse less often, so that the transition from natural to artificial feeding does not impress the child unfavorably. It is advisable to defer weaning until after the summer months, especially in cities, because of the child's predisposition to attacks of bowel trouble during this period of the year.

What I have stated so far refers entirely to infants who are not deprived of their natural food obtained in the natural way. It so often happens however, that a child is deprived of its mother at or near its birth, or that through a variety of causes the mother is unable to suckle her infant early after its birth, and recourse must be had to artificial feeding.

The wet-nurse affords the most typical substitute for the mother in the feeding of an infant. Since she cannot be obtained in the large majority of cases, some other food simulating as closely as possible mother's milk is obviously required. We read announcements in every journal and newspaper,

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and we see on the shelves of every apothecary shop, numerous artificially prepared articles in both liquid and solid form claimed to be "just the food the baby needs to thrive and do as well on as if it nursed its mother."

It is useless to remark that the large majority of these productions are useless for the purpose for which they are intended. The only kind of milk most readily obtained and which resembles as closely as possible human milk is that of the cow.

This differs from human milk in the percentage of the different ingredients it contains, being richer in butter, casein and salts and contains less sugar and water. Milk from old cows is less nutritious than that from younger animals and is also more liable to be diseased.

It should be obtained from a herd of healthy young cows instead of from a single animal, because a mixture of milk from different cows is quite apt to be uniform in quality from day to day, while that from a single cow may vary daily according to changes in her general condition.

The dairy should be regularly inspected by a competent veterinarian, and no milk should be allowed to enter the market from premises where contagious diseases exist. Whether cow's milk had better be boiled or given in a fresh state to infants, has advocates for and against.

Nevertheless, it is advisable to boil or sterilize all food and drink given artificially-fed infants during at least the hot season of the year. Milk fed an infant should be alkaline in reaction, and while milk from grass-fed cows is alkaline, that from barn-fed cows is acid, and should be made alkaline by the addition of limewater or soda.

A teaspoonful of a solution of one dram of sodium bicarbonate to six ounces of water, given with each feeding, is a simple mode of producing this effect.

It has been my experience that milk from cows fed on green

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corn during the fall of the year almost universally causes bowel disturbances in bottle-fed infants.

A uniform temperature of the milk at about 99° F. is most agreeable to the child's stomach.

Very few young infants can tolerate pure cow's milk on account of its variance from mother's milk in the proportion of its different ingredients.

The larger amount of proteids, fat and salts can be properly reduced by the addition of water, while the deficiency of sugar can be supplied by the addition of milk-sugar, or possibly cane-sugar. New-born infants require a dilution of one part of cow's milk to five of water.

This proportion should gradually change, so that at about ten months the infant receives the milk pure. An even tablespoonful of milk-sugar dissolved in boiling water and filtered, is the proper quantity for about eight ounces of food.

This solution of milk-sugar must not be allowed to become older than one day at most.

The regulation nursing-bottle, sold at the shops, should absolutely be discarded in favor of an ordinary three, four, or six ounce vial, according to the age of the child, and an ordinary rubber nipple. Mothers and nurses as a rule are not sufficiently scrupulous in cleansing the complicated arrangement of the regular nursing-bottle and, in this way, feed their babies unwholesome milk.

I usually instruct my families to have several rubber nipples on hand so as to have at least one lying in a borax or soda solution while the other is being used. They are easily cleansed and therefore furnish no source for contamination. It frequently happens that babies cannot tolerate cow's milk at all, even when prepared so as to resemble mother's milk as nearly as possible. If the milk is given sufficiently diluted to be easily digested the little ones wilt away, become emaciated and display all evidences of malnutrition.

Or, on the other hand, if given more concentrated, it will

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form large curds, cause vomiting, diarrhea, or obstinate constipation also attended by non-assimilation and malnutrition. Such children, as a rule, do well on condensed milk. I invariably prescribe what is known as Anglo-Swiss Condensed Milk, marked on each can "Prepared in Switzerland," and I never have trouble.

Whenever in my practice any other brand of condensed milk was procured, either by mistake or because the brand ordered could not be obtained, the little ones invariably failed to improve or grew worse, while a return to the favorite brand would soon be followed by a healthy digestion.

Children brought up on this brand of condensed milk have all the appearance of perfect health, and the prejudice so often heard against this form of infant food must arise through the employment of inferior brands.

Whatever the food of an infant may be, if at any time it shows evidences of indigestion, or becomes affected with one of the different forms of diarrheal trouble, it is always best to introduce a change of food.

This alone often corrects the disturbance. The mother may begin to menstruate during the early months of lactation, or she may become pregnant soon after the birth of her child.

In the former instance she may suffer such systemic disturbances as to change her lacteal secretion sufficiently to injure her child. The little one may have severe attacks of indigestion and even go into convulsions. Here a substitute must be employed during the days of menstruation, and a day or so thereafter a return to the breast may be made.

During this period of suspension of nursing, the breast-pump must be regularly used to keep up the secretion of milk. In the case of early pregnancy it will be necessary to wean the child entirely, both on account of the deranged condition of the milk, and also on account of the drain which lactation produces upon the mother.

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Tuberculosis in the mother, or an inability to suckle her child on account of the wasting and debilitating effect it produces on her, are also reasons for weaning. Acute diseases in the mother do not necessarily call for weaning of the child, unless the disease extends over too long a period of time.

In this instance the secretion of milk will be too scanty to supply the wants of the child, and one of the numerous substitutes must be added to compensate for the deficiency. Milk from a healthy mother with sound breasts is practically sterile, while a fissured nipple or an inflamed breast may be the cause of severe digestive disturbance in the child. If at all possible, milk should constitute the chief article of food during the first year of life, and one of the chief articles of food during the entire period of infancy.

At the age of six months small quantities of farinaceous food may be given with the milk diet. Later, the softer kinds of solid foods, such as oatmeal gruel or rice, well-cooked, and small quantities of beef broth may be added, so that at the age of from twelve to fifteen months the food will be of greater consistence.

Crackers and stale bread may now be boiled in water or beef broth and fed with a spoon. Small quantities of baked potato with butter and salt, and perhaps a little soft egg, also agree well at this time.

Vegetables should not be given during the first year of life, and sparingly during the second. The child now has all its incisors and some or all of its molars, and is prepared to chew soft meats in small quantities. To this may be added during the close of the second year, puddings of rice, cornmeal, sago, etc.

Milk, however, should be given with regularity at meals, and draughts of cool water between meals to allay thirst. At the age of two and one-half to three years all the teeth have

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made their appearance, and the child may now gradually acquire access to the general table.

However, on account of the entire absence of will-power, the child is placed at the mercy of its stomach, and the kind and quantity of food taken by it should for some time to come be regulated by the parents or nurse.

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THE HYGIENE OF MILK AND ITS RELATION TO INFANT FEEDING.

BY W. C. BENNETT, B. S., M. D., OF MILWAUKEE.

It is my purpose in treating this subject to apply such general rules to a special subject as our knowledge of bio-chemistry will permit. Such treatment is partly speculative, it is true, but this is unavoidable.

THE COMPOSITION OF HUMAN MILK.

One of the most striking peculiarities of human milk is the variability in the relative quantity of its constituents. It varies greatly in different women, and also in the same women at different times and under changing conditions. The amount of fat, at any rate, varies greatly, according as the milk is that which first flows from the breast, or is from the nearly exhausted breast. The milk in the first instance will contain perhaps only 2 per cent. of fat, while that in the latter case may contain 7 per cent. or 8 per cent. of fat. Consequently it makes the greatest difference from what part of the breast the milk is obtained, not only when taking a sample for analysis, but also to the child, because unless the breast is nursed entirely dry the child will not get that milk which is richest in fat. Moreover, the frequent complete emptying of the breast tends to produce milk richer in fat. So, if a woman produces a large amount of milk, poor in fat, the child may be deprived of sufficient fat, even when there is plenty of fat for it. Under the circumstances it would seem to be the proper thing to diminish the amount of fluids taken by the mother. This would diminish the actual amount of milk so that the child could get the final richer portion, and it would also increase the actual amount of fat. The converse also

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holds true, though probably not many nursing children receive an inordinate amount of fat.

The proteid matter of human milk amounts to about 2 per cent., and differs from the milk of other mammals (except that of the ass) in its method of coagulation. The casein coagulates in fine flakes, whereas the casein of other animals coagulates in large chunks, and is, therefore, less easily digested.

In the delicate stomachs of some infants this fact must play an important part.

The lactose amounts to 5 or 6 per cent., and possesses no peculiarities in human milk.

The analysis of the ash shows calcium, potassium, and phosphorus to be present in greater amount than the other elements. It contains a small amount of iron. Under most circumstances human milk is sterile.

COW'S MILK.

Cow's milk contains about the same amount of fat, nearly twice as much proteid, and less lactose than human milk. The ash shows a higher percentage of calcium and phosphorus. The proteid coagulates in large chunks ordinarily, and as received and used is never sterile. Its reaction, as well as that of woman's milk, is slightly alkaline. Milk from cows fed on distillery slops may contain alcohol. Cow's milk is said to contain resorcin, which acts as a natural germicide.

MILK OF OTHER ANIMALS.

The milk of other animals varies greatly, but all (with the exception of asses' milk) possess casein which coagulates in large chunks.

The milk of no other animal possesses any quality which gives it any advantage over cow's milk in infant feeding.

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MILK AS A FOOD FOR INFANTS.

Water, constituting as it does so large a proportion of the body, forms a large part of the milk, and amounts in woman's milk to 700cc or 800cc a day. This amount, however, is usually insufficient for the needs of the child, and therefore additional water should be given to it.

Proteid.—The proteid of milk is of two kinds: 1. Caseinogen, a nucleo-albumin, and 2. Lactalbumin. The first constitutes nearly the whole of the proteid content of human and cow's milk, and is of great importance. The action of the rennet-ferment is to convert caseinogen into casein, a coagulated proteid, and this is acted on by the pepsin and hydrochloric acid in the stomach and converted into peptone, the diffusible proteid.

Caseinogen, being a nucleo-albumin, contains a large amount of phosphorus. The importance of this fact will be seen when we remember that bone and teeth consist mainly of phosphates, and that in infants the bone-forming process is most active. The absolute necessity for the presence of phosphorus is emphasized by the fact that eggs, the food of all vertebrates, except the mammalia, also contain a large amount of phosphorus. It is probable that though phosphorus may be assimilated as an inorganic salt, it is more easily handled, and nature evidently intended that by the young it should be handled in organic combination.

Fat.—The fat in milk is one of the most variable constituents and serves the same purpose that fat usually serves as food. Being a natural emulsion, it is probably in the condition in which it is most easily absorbed. Milk fat also contains a small amount of lecithin, a phosphorized fat. In the egg, lecithin constitutes the chief source of phosphorus. Excess of fat may produce diarrhea and too small an amount of fat, of course, partial starvation.

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Lactose, or milk-sugar represents the sole carbohydrate in milk. Cane-sugar or starch are not present.

The function of the fat and lactose is to prevent waste of proteid. Their oxidation produces the heat requisite to maintain the body temperature. It goes without saying, that a good supply of fresh air is essential. It must not be forgotten that oxygen is a proximate principle, without which food would be useless.

Foremost among the salts in milk is calcium phosphate; foremost in quantity and in importance. It is an absolute essential in new tissues, since growth cannot take place without it. It seems to have an effect similar to the catalytic effect of enzymes. Its presence is necessary to the instituting of growth. Moreover its important rôle in the formation of the skeleton of the child makes its presence in food imperative. When it is withheld, or when under certain abnormal conditions of metabolism calcium phosphate is not deposited in the bones and teeth, rickets is produced. Normal bone contains from 50 to 60 per cent. of calcium phosphate, while a rickety bone may contain only 30 per cent.

A condition somewhat similar to rickets is infantile scurvy, which is produced by a lack of organic acids in the food. This deficiency tends to lessen the alkalinity of the blood; and to maintain the normal alkalinity, the alkaline phosphates are retained in the blood.

ACTION OF BACTERIA.

Milk is one of the best of media for the development of bacteria, and as a consequence, when milk is exposed for ever so short a time to the air, more or less bacteria will fall into it, and at temperatures between 50° F and 100° F. will develop with great rapidity, so that the milk handled in the usual way, with no attention paid to cooling, may, by the time it has reached the consumer, contain millions of bacteria in each cc. The first and most common effect of this growth

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is the conversion of the lactose into lactic acid, and if the proper germs are present some of this may be converted into butyric acid. The lactic acid further causes a precipitation of the caseinogen, and we have produced the condition commonly known as "sour milk." The presence of lactic and butyric acids in the stomach are a source of irritation, deranging its secretions and producing acute or chronic dyspepsia. Moreover, the precipitated caseinogen is not in a favorable condition to be acted on by the gastric juice, and slow digestion is a consequence.

On the fats bacteria also have a marked effect, breaking them up into the various fatty acids and glycerin.

It is from the proteid that the most dangerous products are formed, however. Under certain circumstances there are formed the poisonous ptomains and toxalbumins, whose poisonous properties vary in intensity from weak irritants, which act mainly locally, producing simple diarrhea, to those which produce intense constitutional disturbance and death. Vaughan says that infantile diarrheas of a mucous or catarrhal nature are produced by saprophytes, while those of a choleraic or serous nature are of parasitic or pathogenic origin. Aside from these varieties which produce deleterious chemical changes in the milk, there are not infrequently present the true pathogenic bacteria. Tuberculosis, typhoid and diphtheria may be disseminated in milk. Dr. Adams quotes Busey and Kober's tables showing "138 epidemics of typhoid fever, seventy-four of scarlet fever, and twenty-eight of diphtheria, directly traceable to infected milk."

Some idea of the importance of impure milk in the death-rate of infants (it being admitted that nearly all diarrheal diseases are due to this cause) may be derived from the statistics of a few of our larger cities. In New York city there were 3,208 deaths in 1895 and 2,874 in 1896 from diarrheal diseases. In Brooklyn in 1896 there were 1,697, and in Chicago in 1895 there were 1,638, and in 1896 1,465. In

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Milwaukee there were 323 in 1895, 298 in 1896 and 244 in 1897.

The remedy naturally lies along the direction of improvement in the quality of the food given where other than breast-milk must be used. This subject has received much attention in this country of late years, and experimentation has been carried sufficiently far to permit of quite definite conclusions. At least this one fact may be considered as settled: Wherever conscientious and systematic effort has been put forth to improve the quality of the milk-supply there has been a corresponding decrease not only in the deaths from diarrheal diseases, but also in the deaths of infants from other diseases, since many infantile deaths are indirectly due to loss of vitality from improper nourishment.

One of the best known examples of such efforts to obtain purer and better milk is the Nathan Strauss Milk Charity of New York. Dr. Freeman has shown that while the number of deaths in New York for the years 1894, 1895, and 1896 was 2,330 more than for the years 1890, 1891, and 1892, the deaths from diarrheal diseases were 860 less and for children under five years 370 less. The earlier period was before the Nathan Strauss Charity was instituted and the later period was after it was well established.

In Rochester, where a depot for the sale of good pasteurized milk was founded in July 1897, the statistics show the following improvement over 1896 for the months of July and August; July, 1896, under 1 year, 108; July, 1897, 43; August, 1896, 59; August, 1897, 48.

Here in Milwaukee the systematic inspection of milk has produced, apparently, very favorable results, the most marked difference being for the months of July and August.

	Diarrheal diseases.	Under 1 year.	1 to 5 years.
July 1896	90	210	34
" 1897	35	83	24
August 1896	97	209	38
" 1897	91	156	40

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THE MILK OF ANIMALS OTHER THAN THE COW AS SUBSTITUTES FOR MOTHER'S MILK.

As mentioned above, the casein of the milk of all domestic animals, except that of the ass, is precipitated by the rennet in large lumps as does that of the cow.

Moreover their milk does not approach the composition of the mother's milk more nearly than the cow's, and besides, as a rule, they are difficult of access. Asses' milk contains about one-third as much fat as human milk, though it is quite similar otherwise.

ARTIFICIAL FOODS AS SUBSTITUTES FOR MOTHER'S MILK.

This is a phase of the subject that deserves the serious consideration of every physician, mainly from a hygienic standpoint, but also from an economic one.

These foods may for our purposes be classified as, 1. Condensed milks. 2. Farinaceous foods (made from flour). 3. Liebig's foods (*i. e.*, malted preparations). 4. Peptonizing agents.

First. Condensed milk is evaporated, and either with or without cane-sugar added as a preservative. Of fifteen foreign brands analyzed by Blyth, from 34 to 50 per cent. of cane-sugar was present. In ten American brands there was no cane-sugar. Speaking of condensed milk, Dr. Holt says: "This is still widely used by the laity in the country as well as in the city, and I am sorry to say is advised by many practicing physicians. During the past five or six years I have been engaged in examining critically all children with reference to the effects of the prolonged use of various forms of diet, and I have yet to see an infant reared wholly on canned condensed milk, who did not exhibit the signs of rickets to a greater or less degree, though a few would have passed at first glance as particularly healthy specimens. The feeble resistance of condensed-milk babies to acute diseases has

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long been noted by many observers." Condensed-milk babies are liable to be afflicted with scurvy, but fresh milk is an anti-scorbutic.

Second. Farinaceous foods are made from flour and are prepared by adding fresh cow's milk to them. As some one has said, "they are successful in inverse proportion to the amount used." They contain a large amount of starch, as high as 75 or 80 per cent., and as the pancreatic juice in infants contains no amylopsin, or starch-converting ferment, this can only be acted on by the saliva, and since the food is not masticated this action must be very slight.

Third. Liebig's foods, on the other hand have, or pretend to have the starch converted by the diastase of malt into maltose and glucose. Often this is not so converted. They are expensive at best.

Fourth. Peptonizing agents are useful in certain conditions where the stomach is unable to handle the proteid, but they should be used only temporarily, to give the stomach needed rest.

MODIFIED COW'S MILK AS A SUBSTITUTE FOR MOTHER'S MILK.

By this term is meant any change in cow's milk to make it more like mother's milk, and better adapted to the needs of the infant. Without going into detail it may be said that the addition of water, sugar, and cream in certain variable proportions to cow's milk, with perhaps sterilization or pasteurization, constitute the methods used to bring about the result.

Sodium bicarbonate is often added, but this is undoubtedly wrong, for as Vaughan says, the hydrochloric acid of the gastric juice is the only antiseptic of the digestive tract, and to destroy its action by neutralizing it, he considers the second principal factor in the cause of diarrheal diseases of bottle-fed babies. Lime-water also neutralizes the hydrochloric

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acid, but it is superior to the soda since it prevents the precipitation of the casein in large chunks, but tri-calcium phosphate would have the same effect.

Sterilization of milk is said to make it less digestible, and it also changes the taste, which is generally disadvantageous. I believe it is but little used now. Pasteurized milk is used a great deal, and if the pasteurization is properly done it is certainly useful. But often it is improperly done, and it may be a feeling of security is produced which may lead to disastrous results. If the milk is pasteurized after the ptomains are developed, their activity is in no wise injured by the heating process, and dangerous poisoning may occur.

Sometimes even pure milk will disagree with the infant, and there will be signs of decomposition of food, and diarrhea. This is caused by a variety of bacteria which are partial to the animal food—milk, and they may be quickly starved out if barley water is given for a few days.

MILK REGULATIONS.

The aim of those departments of health which attempt to regulate the quality of milk, is to see that the milk-supply does not fall below a given standard of butter fat and total solids, that it contains no adulterant or preservative. If it were possible it would be of great benefit to establish a standard of freshness of the milk, but I do not know that this has ever been done.

Numerous private companies or individuals and a few quasi municipal concerns have gone farther than this, and have sterilized or pasteurized milk for limited distribution, and they have also provided a "certified milk,", possessing a definite amount of butter fat and containing less than a given number (usually 10,000 per c. c.) of bacteria.

Milk laboratories have in addition to these functions, that of filling physicians' prescriptions for infants' food, giving exact percentages of each class of food according as the phy-

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sician deems necessary for the welfare of the infant. If the appearance of the child or of its stools indicates that the child is receiving too much or too little of any of the component parts of the milk, the physician has only to indicate the required change in his prescription, and have it filled at the laboratory.

Where this has been done, the highest praise has followed its workings and there is no doubt that a great many infant lives have been saved by this means.

At some of these laboratories a trained nurse is stationed, to give the mothers (among the poorer classes) such instruction in regard to the care of infants as may appear beneficial. This not only in regard to feeding, but to other hygienic matters as clothing, bathing, sleep, etc., as well.

HOW MILK SHOULD BE HANDLED.

Not one milkman in a thousand understands the sanitary handling of milk, even to a slight degree, and as a matter of fact little or no milk is properly handled. The small dealers have neither the money nor the knowledge to enable them to keep and feed and care for cows and milk in a cleanly and proper manner, and the large dealers buy all their milk, and know little or nothing of its treatment before it gets to them.

The modern idea in regard to the care of milk, especially for infant feeding, is to have the farm where the cows are kept, in a locality that is easy of access by those who buy the milk. This will insure a system of inspection which will aid in the prevention of negligent methods. The barns should be so constructed that the cows could be kept comfortable and *scrupulously clean.* The cows should be perfectly healthy, tuberculin-tested animals, supplying milk containing from 4 to 4.5 per cent. butter fat. They should have food selected for its known value in producing a good quantity and quality of milk; plenty of pure water is absolutely essential. The milking should be done in a perfectly cleanly manner, by

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healthy men in clean clothing. The milk should be immediately cooled to 35° or 40° F., and then put in sterilized glass bottles and sealed; or if the milk is for prescriptions, it should be first separated and then put in sterile containers, which should be placed on ice, and delivered as soon as possible.

No elaborate outfit is necessary. Simply the means to keep the milk clean and cold. Yet for the lack of these, thousands and thousands of children die annually. Is it not time that a reform was instituted in every town and city where babies are crippled and killed by fake infant foods and impure milk?

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OPTICIANS AND SPECTACLE PEDDLERS.

BY GILBERT E. SEAMAN, M. D., OF MILWAUKEE.

Chairman of the Committee on Ophthalmology and Otology.

Rather than discuss any purely scientific subject in ophthalmology at this time, I have chosen to present for your consideration a few thoughts in relation to the present attitude of the profession toward opticians and spectacle peddlers.

Making a rough estimate I should say that three-fourths, at least, of all cases of errors of refraction are treated by the optician, generally some man who combines the business of treating eyes with that of selling jewelry, dry goods, groceries, drugs, or hardware.

This is by no means as it should be, and I desire to present to the medical profession of this State, in my humble way, an argument against the encouragement of the traffic. I will endeavor to be conservative and fair, and, therefore, at the outset I will admit that in some localities there is some excuse for the existence and trade of the optician who prescribes glasses. If the optician would confine his efforts to those cases which he can properly handle—well and good, but he does not do this.

The ordinary case of presbyopia in a healthy eye may be well taken care of by the optician, but even here the danger is that the optician may not be able to say whether or not the eye is healthy, and in many cases it is only chance if he does not put glasses on an unhealthy eye—one with cataract, optic atrophy, or what not. Many cases of seeming errors of refraction are diseased conditions; spasm and paralysis of accommodation, choroiditis, optic atrophy, retinitis, beginning cataract, have been, and are, easily mistaken for errors of refraction and glasses prescribed by opticians, the delay thus

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occasioned very often leading to serious consequences to the patient.

Many instances of permanent impairment of eyesight due to disease could be cited by physicians of experience where glasses have been ignorantly prescribed by opticians and spectacle peddlers, and the patient thus lulled into a false feeling of security.

In dealing with these cases, I would, therefore, lay down the following propositions:

No glass should be prescribed without ophthalmoscopic examination.

No glass should be prescribed without the use of a mydriatic in patients under forty, and where no contra-indication to the use of a mydriatic exists. Opticians almost never use a mydriatic, indeed they have no right to do so; a mydriatic should only be used by the physician.

I have made careful enquiry and am unable to learn of any optician of the fifteen or more in this city who uses the ophthalmoscope as a matter of routine. One or two use it occasionally, but very indifferently.

Many diseases first manifest themselves in troubles of vision which the physician recognizes, interprets and treats, while the optician does not and cannot be expected to do so. It is a matter of every day occurrence in the practice of a busy oculist, for some poor victim of the six weeks optician to present himself with a history of unsuccessful attempts to improve vision by glasses lasting over months, or, until he happens to be sent to a physician, only too often to find that valuable time has been lost and not infrequently vision also.

In cases of paralysis of accommodation which result from diphtheria, rheumatism, fevers, or are symptomatic of cerebral trouble, disease of the spinal cord, syphilis, diabetes, etc., the patient should certainly go to a physician, because, while it is good practice to stimulate the ciliary muscle by

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use of weakest convex lens which enables the patient to read, much depends upon knowledge of cause, the proper use of a myotic, use of electricity and attention to the general condition of the patient. It is out of the question to expect the optician to properly treat these cases.

Spasm of accommodation not infrequently occurs as a result of uncorrected error of refraction, as the result of a contusion of the eye-ball, and in cyclitis, and also in eyes of normal refraction, from over-work. There is a feeling of discomfort in the eye, increased secretion of tears and lessened acuteness of vision. The symptoms may point to myopia, especially in eyes of normal refraction, and also in hypermetropic eyes. In these cases the general health should be attended to; the use of a mydriatic is imperatively demanded, and, consequently, they should be treated by a physician.

It is not an unusual thing to find persons wearing concave glasses prescribed by an optician without a mydriatic, in a condition of spasm of accommodation, and cases have been recorded where patients have for years worn as high as –6–7 spherical where refraction was emmetropic.

Opticians should not treat these cases. They do not use mydriatics and myotics when necessary, and, if they do, they are violating the spirit if not the letter of the medical law of our state which prohibits others than physicians from prescribing drugs for the relief or cure of any infirmity or disease for pay. If these cases do not represent infirmity or disease I am very much mistaken.

It is a simple thing for a person to apply the subjective tests for errors in refraction, or, in other words, allow the patient to select the glass with which he sees best, as is done by opticians in presbyopia, but in the great majority of cases of errors of refraction the utmost skill, care, and medical understanding is necessary in order to do the best possible for the patient.

It is the too common practice for the general practitioner

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to tell a patient who complains of symptoms pointing to errors of refraction, to have his eyes examined, or to get a pair of glasses. This is always bad advice unless the case has been carefully inquired into, and should never be given lightly. If indications point to errors of refraction the general practitioner should attend to the matter himself, or refer the case to some physician who can and will do so.

In a circular recently sent out by a leading optician of this city, after referring to the relation of the eye to disease of the nervous system, he says: "The increasing number of physicians who are availing themselves of my offers to send them a diagnosis of each case shows that there is a growing desire among the fraternity to know the exact state of the eye before pursuing a course of medical treatment."

Patients often object to going to the oculist on the plea that they cannot afford to pay his fee; as a matter of fact the average fee of the physician who prescribes glasses is little more than the spectacle dealer charges for his services and wares, and very often a great deal less. I know of many poor people who are wearing a gold washed glass for which they have paid two prices to the optician, thus, as they think, avoiding the fee of the physician. I have taken the trouble to make some enquiries into this aspect of the question among my colleagues, and from the knowledge thus gained feel justified in stating that I do not believe there is a physician making a specialty of ophthalmology in this State who would refuse his services to any worthy person referred to him by a brother practitioner with the information that he is unable to pay the usual fee. Thus there seems to be no reason on this score why physicians should turn over their eye cases to the tender mercies of the optician or spectacle peddler.

I had thought that I would recite a few cases coming to my attention, of diseases of the eye which have been treated to glasses by the optician when the services of a physician were necessary, but as similar cases are of such common oc-

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currence and within the knowledge of every man whose attention has been directed to the subject, it is unnecessary for me to take up the time of this Society with such recital. I will content myself with referring you to the case-book of any physician in active practice who treats diseases of the eye.

DISCUSSION.

Dr. Zimmermann: Although I am in general perfectly in harmony with what Dr. Seaman said, I want to make some remarks about a minor point of his paper, where he says he would employ mydriatics in all cases below forty years, which I cannot concede. If the physician is perfectly familiar with the direct method of opthalmoscopic examination, I do not think it is necessary to make that a rule for all cases. Of course, if you have to deal with obstinate astigmatism, I would advise it also in some cases of low degrees of hypermetropia, in which the patient cannot relax his accommodation. But as long as the oculist can accomplish his object otherwise, I do not think it is necessary to employ mydriatics.

Dr. Würdemann: The evil of the optician is something we have to bear with on account of long established custom. It is very similar to the evil of the prescribing druggist who deals out the favorite prescription of the physician from whom he gets the most work, to the next man that comes in with a cough. That man is practising medicine, is he not? So is the optician; for the presciption of glasses by the physician is in many cases not given alone to procure good vision, but to relieve many other affections. Probably one-third of the patients applying to the specialist or to the physician for glasses have nearly normal vision, and yet many of these have nervous affections, headaches, etc., for which the physican prescribes glasses as he would medicine. Thus when the physi-

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cian prescribes glasses he is practising medicine the same as if he gives a drug. Therefore the optician is practising medicine when he prescribes glasses. It is a well recognized fact that the majority of young persons must have their refraction measured while the eyes are perfectly at rest under the influence of a mydriatic. Now if the optician be allowed to do that, he is likewise practising medicine according to the laws of this state, as I understand it. It would be hard to find a reliable "optician" in this city, and there are but few in Chicago, few in Philadelphia, New York and the other cities, men who thoroughly understand the business, how to measure eyes subjectively or objectively. The prescribing optician does not hurt the physician in his business. In fact they make business for him, they make cases. Often we have to take off glasses that are prescribed by the jeweler and the optician, glasses that are doing harm. It is but seldom that I have found a patient who has been wearing glasses given by a jeweler or optician in whom the glasses are fully satisfactory or nearly correct.

Dr. Bradfield: This is a question that is very important to all of us, and what Dr. Würdemann has said about a certain class of opticians doing the specialist's work, I certainly corroborate, for they certainly make us a great deal of work and make the public a great deal of expense, and yet we must not try at present to do away with the optician. There are too many people in the world that think a cheap glass is just as good as one fitted by the best specialist, providing that they can see with it, and we must have some one to furnish that class of people with goods, for they will have a cheap glass or go without. Then there a great many places where it is impracticable for people to obtain glasses unless they can go to some jewelry store or optician to get them. I am in favor of a law governing opticians the same as governs the practice of medicine, and one that would govern to a certain extent the ability of the optician. Our laws do not govern the ability

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of the general practitioner, nor do they govern the ability of the specialist, but we can have a board to examine opticians and determine approximately whether they are capable of properly doing their work. Opticians should be capable of fitting plain presbyopic glasses; but myopia, astigmatism and the higher degrees of hypermetropia should be left to the oculist when his services can possibly be obtained. I have to differ with my friend here in regard to the use of the mydriatics. In many cases of young people a mydriatic is absolutely essential to do perfect refraction work, and yet there is a great deal of refraction work done in patients under forty years of age that may be done and well done if a person uses all the means of examination without the use of the mydriatic.

Dr. Edsall: Dr. Seaman's paper is a timely one. The optician evil is not growing less, but worse as time goes on, and I think it will not be many years before some measures will have to be taken by the several states to limit the injury done to the eyes of a large number of people. There is no man in the practice of ophthalmology who does not constantly meet with cases of myopia which have become such through imperfectly fitted glasses. There is scarcely a patient with a low degree of hypermetropic astigmatism, who without a mydriatic, in the young individual at least, will not select a concave lens. Now the optician has no more right to use a mydratic in the eyes of a person coming to him for glasses, than the druggist has to prescribe a potent drug for a person coming to him complaining of feeling sick. Should the optician appreciate this and attempt the prescribing of glasses without the mydriatic, it happens almost always under such circumstances, with low degrees of hypermetropia or hypermetropic astigmatism, the patient will select concave lens, and the result of the continuous use of these is very apt to be, in the course of time, if it is possible for the patient to wear them at all, that a choroidal trouble will be set up, and as time goes

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on myopia will occur and will increase from diopter to diopter, until the patient may be incapacitated from using his eyes. I go further than Dr. Seaman and say that there are very few cases under fifty years of age where it is justifiable to prescribe glasses without a mydriatic. It may seem like a sweeping statement, but I am convinced that there is no test that we have at command that we can absolutely rely upon as correct in prescribing glasses so long as the accommodation is active; and if we are to attempt to gain accuracy it is better to go all the way and be absolutely accurate. In a great many cases under fifty you will find that there is a certain amount of residual accommodation, and this residual accommodation can only be relaxed by the use of a mydriatic. Now in such cases the closer you get to the age of fifty the more dangerous does it become for the optician to use the mydriatic. There is no case where it is justifiable in my opinion for him to prescribe it and especially is it not in these. Consequently it is even more necessary that a patient approaching fifty should consult an oculist to obtain glasses than for a younger patient. I could cite many cases where much harm has been done by glasses which opticians have prescribed, not to mention the great amount of discomfort they have caused. The average individual with defective vision has an idea that, no matter what its cause, all he requires to restore good sight, is a properly fitted pair of glasses; that if his vision is not satisfactorily improved by the glasses he obtains, the reason is that he has not found just the pair of glasses he requires. He may think the glasses that he gets from the optician are in a certain degree satisfactory and hopes, some day, to find just what he requires, while all the time his defective vision may be due to some serious intra-ocular malady, and the fact that he has, for a longer or shorter time, been content to hope for improvement from the glasses, means, very often, that he has lost time that has been of the utmost importance to the proper handling of

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his case, and damage has been done which cannot be repaired. I think, therefore, that the idea of sending a patient to an optician, or even for an individual to go to an optician himself, is reprehensible. Even as to whether a simple presbyopia is a condition for which the optician can justly prescribe, the point comes up, how is optician or patient to say definitely that it is a case of simple presbyopia. There may be intra-ocular trouble or astigmatism, and yet in most instances nothing more is done beyond giving glasses to correct simple presbyopia; I look upon the optician in the capacity of a prescriber of lenses as almost an unmixed evil; in his proper sphere, which bears the same relationship to medicine as does that of the conscientious pharmacist, the skilful optician is an indispensable aid to the physician. Dr. Seaman's paper I look upon as an extremely timely one.

Dr. Barnes: I did not hear Dr. Seaman's paper, so that I cannot discuss it, but the point that has been brought up by the gentlemen who have engaged in the discussion, indicates the trend of the paper. I think that all ophthalmologists agree as to the evil of the optician, but there is one point that I wish to emphasize, that is, I think it is time that the medical profession took this subject up and had it established in our State laws. We fail in one thing; realizing that an error of refraction is a disease. Disease is an abnormal condition, and an error of refraction is an abnormal condition, therefore, I believe it can be classed as a disease as much as any other abnormal condition of the body, and, I think, that anyone that undertakes to fit glasses is practising medicine, because he is treating an abnormal condition of the body. I consider that Dr. Seaman is correct in making a practice of using mydriatics in all cases under forty years of age. I believe that you will be always on the safe side to adopt that method. There are some cases where, perhaps, it may not be absolutely necessary to use mydriatics; but I have been mistaken several times when I thought on first examination

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that I would not need it, but after using a mydriatic I found, even by retinoscopy, that there was more of an error of refraction than I had discovered before. I cannot agree with Dr. Edsall that you should use mydriatics up to fifty years of age. I believe that between forty and fifty years of age, with very few exceptions that you can get along without the mydriatic, but you may run up against a snag if you do not use it in many cases there.

I hardly agree with Dr. Bartlett about the presbyopia. I believe a person should adopt a certain method with presbyopes the same as with other cases. There are a great many cases of presbyopia coming to you that have astigmatism, and that has got to be corrected first. A presbyope may sit down and try to fit himself until doomsday, and he cannot do it if he has other ocular trouble, such as an error of refraction.

I want to make one exception in regard to the use of mydriatics in patients up to forty years of age, that is, I think that a great many myopes do not require mydriatics.

Dr. Fuchs: I see that specialists are eternally going into the general field. What have they to do with gout, neurasthenia, syphilis, albuminuria, or diabetes? Will they please keep out of that field and confine themselves to treating the local manifestations. The general practitioner has not had a word to say in this meeting so far. Dr. Helm tried to bring up that very matter and was cut off, and there was no discussion. No eye specialist has any business to prescribe general remedies. He is to treat the eye and the eye only.

Dr. Seaman: I will first reply to what Dr. Fuchs has said. If I were compelled to fit glasses and treat diseases of the eye, ear, nose, and throat without the use of general remedies I would retire from the medical profession to-day and engage in some more profitable employment. If I cannot be a physician, then I don't care to be a spectacle peddler.

In regard to Dr. Zimmermann's remarks about the use of

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mydriatics, and the remarks of the other gentlemen, I stated in my paper that I believed in the use of a mydriatic up to age of forty in all cases where a contra-indication to the use of the mydriatic does not exist. Of course, where the necessity does not exist the absence of the necessity is a contra-indication. I do not use a mydriatic in all cases up to forty, because I recognize the fact that occasionally, (but it is very occasionally) we get a case where the correct refraction may be attained without the use of mydriatics.

In regard to Dr. Bradfield's remarks in relation to the necessity for a law regulating the practice of the optician, I do not believe in it. I believe the only law we should have should be a law laid down by the medical profession, that in giving advice to their patients, instead of telling them to "go to the optician and get a pair of glasses," or to "go and buy a pair of glasses," or to have their eyes examined, that they should examine them themselves if they feel capable of doing so, or send them to a physician who is capable. I do not admit that there is any better judgment displayed in sending a man who has some infirmity of the eye, to an optician, than there would be in sending our gynecological cases to a piano tuner, or our genito-urinary cases to a plumber!

The discussion has been so thorough, and so full and so satisfactory, that I think nearly all of the points have been covered.

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THE OPERATIVE TREATMENT OF PHARYNGEAL ADENOIDS.

BY H. V. WÜRDEMANN, M. D., OF MILWAUKEE.

(Ophthalmic and Aural Surgeon to the Children's Hospital; to the Milwaukee County Hospital for the Chronic Insane; member of Committee on Ophthalmology and Otology of the Wisconsin State Medical Society, 1898; etc.)

In the great majority of children the adenoid structures of the pharynx are of appreciable size, but usually diminish during or after the period of adolescence. If persistent or enlarged sufficiently to cause nasal or Eustachian obstruction, or if their crypts and glands show a tendency to become inflamed and thus cause unpleasant symptoms, they may be deemed diseased and are applicable for treatment. The necessity for removal of adenoid growths in the pharyngeal vault was not recognized until a few years ago. I did not myself pay proper attention to it during my first five years of special practice; but during the last five years, my experience with the operation has been rather extensive. Nature cures many cases of adenoid disease in pharynx, (hypertrophied pharyngeal, faucial and lingual tonsils), by absorption during and after adolescence. It is only when symptoms of post nasal and nasal catarrh, mouth breathing and deafness appear, that cases come to the notice of the physician.

Effective treatment of pronounced adenoid growth or hypertrophy of the pharyngeal tonsil is essentially radical and surgical. Local medicinal applications are not to be considered in this connection as they are only palliative and no permanent benefit is gained by their use. Cleansing with antiseptic-alkalin solutions by the patient or family as a home treatment before and after operation is a necessary adjuvant. The administration of the iodid of iron is frequently indicated, and all cases require regulation of diet and regimen.

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I have the record of 237 cases in which pharyngeal adenoids of sufficient size to warrant some procedure for their removal were recognized, 189 of these have been operated upon, and without exception all with the most satisfactory results. The following table, which probably embraces more cases than any other hitherto published, has been compiled from my books, most of the cases occurring during the last five years:

AGE.	ANESTHESIA.			Total operations.	Operation advised but not accepted or deferred.	Operation not advised.	Total cases.
	Chloroform.	Nitrous oxid.	Local.				
Under 1 year	5	....	....	5	.....	1	6
1	3	....	....	3	.....	2	5
2	1	....	....	1	.....	1	2
3	7	....	....	7	3	3	13
4	13	....	....	13	4	2	19
5	16	....	....	16	6	1	23
6	16	....	....	16	1	1	18
7	15	....	....	15	4	....	19
8	12	....	....	12	3	....	15
9	13	....	....	13	3	1	17
10	25	3	....	28	2	2	32
11	11	2	....	13	2	....	15
12	7	....	2	9	1	....	10
13	6	...	1	7	3	....	10
14	4	....	2	6	.....	....	6
15	3	....	2	5	.....	....	5
16	2	....	1	3	.....	....	3
17	2	....	1	3	.....	....	3
18	1	....	....	1	1	....	2
19	1	1	....	2	.....	....	2
20	1	2	2	5	.....	....	5
21	1	....	1	2	.....	....	2
25	.....	....	1	1	.....	....	1
27	.....	....	1	1	.....	....	1
35	.....	....	1	1	.....	....	1
36	.....	....	1	1	.....	....	1
38	.....	....	....	....	1	....	1
	165	8	16	189	34	14	237

It shows that this affection is essentially a disease of childhood, a large proportion of cases applying for relief about

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the tenth year. Six cases occurred under one year, whose history showed that the pharyngeal occlusion began a few months after birth. Most cases, however, are first apparent about the fourth or fifth year. The affection is much less after the fourteenth year, but few being observed after twenty years of age. Cases in which these structures persist after the 30th year may be looked upon as exceptional. It occurs in about equal proportion in male and female children.

Preparatory treatment of the patient in those cases which do not accept immediate operation is dietetic and hygienic, together with the administration of iodid of iron or hydriodic acid and simple cleansing of the nose with warm Seiler's, Dobell's, or other appropriate cleansing solution. The day before operation, the nose and naso-pharynx are kept clean by similar procedures.

Most children under the age of adolescence have been operated upon by chloroform anesthesia, assisted by suggestion; a few whiffs of the vapor, together with suggestion to sleep being sufficient to control nearly all children. The co-operation of the patient is a positive advantage, and in but few has it been necessary to induce profound anesthesia. A small number of cases have been given nitrous oxid gas, but the anesthesia thereby produced is so short as to militate against a thorough operation. The few adolescents or adults have been operated upon as office-patients under local anesthesia by 10 per cent. solution of cocain. For general anesthesia the patient lies prone, the head being kept on one side to allow drainage of blood into the mouth, from which it is readily expelled through the efforts of the patient or attendants. The subject not being fully narcotised is always able to respond to orders to spit out the blood and blow the nose free of clots.

The operation preferred is a combination by the large ring-knife of Gottstein or Gruber, the pharyngeal forceps and the finger-nail. After induction of anesthesia the child's mouth

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is held open by the mouth-gag. The left forefinger is inserted into mouth and naso-pharynx, the ring-knife being held in the right hand, the ring being guided over the middle of the growth by the left index finger. By a rapid downward motion the main mass is severed and usually brought forward into the mouth. One sweep of the ring-knife to either side is then made, the left forefinger being inserted to feel if any tags of tissue remain, which are removed by the forceps. The toilet of the pharynx is completed by scraping with the surgeon's asepticised forefinger nail.

The operation is very bloody, hemorrhage ensuing from one-half ounce to one-half pound, immediately after the use of the ring-knife. This occludes the view so that it must be largely done by the sense of touch. This hemorrhage usually fills the nose and mouth and bespatters the operator. In the several hundred operations that I have done there has been no case giving rise to any anxiety on this account. Immediately after removal of the growths the nose is douched by a hot antiseptic solution which cleanses away the clots and shreds of adenoid tissue and stops the hemorrhage. The after-treatment in all cases has been the use of the same warm solution applied every few hours by the glass nasal douche-cup or atomizer.

By this operation, all of the growth being removed at one sitting, we are usually able to dismiss the patient within a few days. In some cases, especially in adolescents who are sufficiently brave to have the operation done under local anesthesia, by the aid of illumination and the throat-mirror, we may do the same procedure as has been described, and a few days later remove any remaining tags of tissue by the small curet and curved forceps. In a few cases the after-application of chromic acid, nitrate of silver or the galvano-cautery may be made to expedite a thorough cure. Adolescents and adults with this disease, generally have sufficient turbinal

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hypertrophy and septal distortion to necessitate further procedure. In most cases hypertrophied faucial tonsils exist which are ablated at the same sitting. The whole procedure takes but a few minutes. Indeed I have a number of times successfully removed both faucial tonsils and the pharyngeal growth in the brief period of unconsciousness afforded by nitrous oxid.

My experiences with uncombined methods, with small curets or the écraseur, or finger-nail alone, the galvano-cautery or chemical methods, have been unsatisfactory. An operation in which several of the instruments are used, varied to suit the occasion, is the best. I have no patience with the standpoint of those operators who deem it necessary to have a number of sittings, as in the majority of cases we are enabled to clear the naso-pharynx in one sitting and one operation.

The results of these operations are usually immediate. The pernicious habit of mouth-breathing is rapidly overcome, and the benefit of free nasal respiration and drainage is soon evinced by improvement of facial appearance; the dull stupid look disappearing and the children becoming bright looking and more intelligent. The air being warmed and purified, the tendency towards colds and catarrhal affections is lessened and, as it is known that many infectious diseases in children are acquired through the upper air-passages, the liability to infection is lessened and many attacks of sickness are saved. If the deformity of chicken breast has already been established, it is soon corrected through the proper breathing obtained. The respiration being deepened, the blood and tissues are more thoroughly oxygenated, and the children rapidly gain in general health and weight.

One of the principal reasons why the aurist is consulted in children having this condition is on account of deafness. This is due to obstruction of the Eustachian tubes. Subacute and chronic aural catarrh with deafness, tinnitus, earache and vertigo in children, are most commonly caused by obstruction of

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the Eustachian tubes, due to adenoid disease in the upper part of the pharynx, and is rapidly cured by removal of the obstruction, and a few subsequent inflations by the Politzer bag. Many cases of acute and chronic suppurative disease of the middle ear with perforation of the drum-head have their origin in infection from obstruction by pharyngeal adenoids, and a cure cannot be obtained by local ear treatment without removal of the cause.

There are few children of tender years who have nasal catarrh. The so-called catarrh is generally situated in the naso-pharynx, and is due to adenoids, which after removal in very young children need no further attention, but in older ones subsequent treatment is necessary.

I have no unpleasant complications. There have been no cases of suppurative otitis media following any of my operations. I have seen, and subsequently treated, two such cases occurring after operation by other men whose standing, however, should allow of no criticism. In a small percentage of cases there has been slight fever for one or two days after the operation, due to slight infection, and in these there has been delayed healing, but in no case has there been any unpleasant symptom after a week. As far as can be ascertained, there have been only three instances where the growth has been insufficiently removed, or in which it recurred in an amount large enough to warrant further operation. I have seldom made a secondary operation in cases which had previously been operated upon by others.

The results achieved by removal of naso-pharyngeal obstruction due to adenoid growths are so brilliant, and the risks are so slight, that when indicated and properly done, there is no more successful and immediately satisfactory surgical procedure.

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DISCUSSION.

Dr. Hitz: I should like to endorse Dr. Würdemann's statement about the benefits derived from this operation. I find that there is no operation with which I am acquainted that will give the same immediate benefit. The removal of the growth is immediately followed by marked improvement in the general condition of the child, particularly if this condition results from the incomplete oxidation of the blood. It is shown markedly in the clearing up of the complexion in children. Where they have been pale and emaciated before, they begin to round out and brighten up in their complexion, and the general conditions are very materially improved. Usually in about one week this is very marked. As far as the removal of the growth is concerned, it is not always necessary in even young children, where there is no marked hypertrophy of the tonsils, to give a general anesthetic. The use of a little cocain in the pharynx, as Dr. Würdemann suggested, will allow of the complete removal of these growths without any general anesthesia, and frequently one can get a young child of perhaps five years of age even, to hold steadily enough to remove these growths completely, by the very first application of Gottstein's curet or ring-knife. Where there is a very large mass, and where it is spread over the walls of the pharynx, filling up the fossæ of Rosenmueller, it is a little bit difficult to remove with a single stroke, and in these cases it is very much better to give a general anesthetic, chloroform being preferable. Frequently parents will object to the administration of chloroform even in very minute doses. These cases occur usually where there has been some unfortunate circumstance attending the administration of chloroform or ether, in their own family, as in a case I had two days ago, where the mass in the naso-pharynx was very great. This I removed completely, or at least I got out an enormous piece, leaving, possibly, two little ends that projected into

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the nasal space which I shall remove with a snare through the nose. They are easily gotten out and with absolutely no pain.

There is one other suggestion I would like to make. Dr. Würdemann, in speaking of this growth, spoke of it as a neoplasm. I do not think in the general acceptation of the word neoplasm that you can call hypertrophy of the pharyngeal tonsil, a neoplasm. I think it is simply an overgrowth of normal tissue, and not a *new* growth at all.

Dr. Barnes: I think Dr. Würdemann has fully covered the subject, and he has very plainly shown to you the reasons for this operation, and the very grateful results obtained from it. There is just one point that he did not mention, and until recently it never occurred to me. The only danger that I ever anticipated from this operation was strangulation, but in a journal the other day I read of a man (I have forgotten his name just at present) who found on operating that there was present an abnormality of the internal carotid artery. He used the Gottstein knife and the child bled to death in a few minutes. The internal carotid was at the side of the pharynx immediately under the mucous membrane. Hereafter I shall always be very careful to examine the naso-pharynx to see that there is no artery that I may sever in doing the operation.

Dr. Bradfield: I would endorse everything Dr. Würdemann has said, but it seems to me, if anything, that he has not put force enough on the importance of the operation. Absolutely there is no other operation that I have seen which has given so universal satisfaction as the operation upon adenoids of the naso-pharynx. I would call attention, however, to one thing in regard to operating under chloroform, which I believe is the proper anesthetic. When there is any great amount of obstruction to the Eustachian tubes, after the patient has been anesthetised he should be drawn to the edge of the table and the head allowed to drop down so the blood

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will not gravitate into the larynx. Many cases may be operated under local anesthesia and I have found eucain more satisfactory in its results than cocain. With the former you need not fear toxic trouble, and can use it more freely than cocain.

Dr. Nash: The operation has been brought out nicely by Dr. Würdemann. I have used the method recommended with good results. There is always much hemorrhage. I never had, however, the misfortune as yet to cut a child's artery. If you will closely watch his description he makes his central cut directly downwards. Now the internal carotid never comes in there. Then he says he cuts on the right side and I suppose directly downward, but really in making that incision he should cut downward and inward, making the incision towards the center as it comes down, and on the opposite side the same. That obviates almost all tendency to reach the internal carotid, which only comes to the surface further below. Now just a step beyond that, I have found with a loop curet lateral cutting, narrow antero-posteriorly, you can still make a little better sweep each way, and you do not need to make the complete depression that you would if you used simply the Gottstein with a sharp knife. You press directly backward over very close to where the internal carotid should be; and if it is nearer the center than it should be you will simply press it.

Dr. Zimmermann: In regard to narcosis, several cases have been reported of immediate death through inspiration of detached pieces of the pharyngeal tonsil, during narcosis. I think we ought to use all precautions to avoid this possibility. If we have once inserted Gottstein's knife into the naso-pharynx, we are pretty safe in making the operation, because then the patient can not remove in. Therefore I do not think we are very cruel, if we we do not employ narcosis in such cases. On the other hand in regard to cocain-anesthesia, Cholewa (Monats whr. f. Ohrenh. 1898) has warned against

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it, as predisposing to hemorrhages, although secondary hemorrhages after the removal of adenoids are very rare. Since the operation is more disagreeable in its psychical aspect than otherwise, I do not think it is necessary in small children to use narcosis at all, in order to avoid the danger of suffocation.

Dr. Bach: The dangers that Dr. Zimmermann speaks of are indeed existing, and for that reason I believe that a great advantage has accrued from the use of a forceps larger than the one that has been passed around here, that is, having larger blades, which leaves merely the smaller particles, that can then be taken out with the Gottstein knife. Then we will avoid the danger of allowing the vegetations to slip down and fall into the larynx, and at the same time succeed in readily getting out the large mass.

Irritations and inflammations of the ears following these operations, as mentioned by Dr. Würdemann are, no doubt, caused by the patient's blowing his nose with great force in his frantic excitement, causing blood to go into the Eustachian tube. I think great caution ought to be used in that direction.

In reference to general anesthesia:

I have been in the habit for some years, of doing this operation without general anesthesia. Although it can be done with satisfaction with a little cocain, and kindly treatment of the patient, since it is a brief operation, I find, nevertheless, that all after-treatment can only be done with great difficulty. Such children learn to be afraid of the doctor, so of late I have altogether operated under partial narcosis, very much as Dr. Würdemann has suggested, which I think is probably the neatest and best way, not losing the confidence of the patient, and always being in a position to follow out later treatment, if it is necessary.

Dr. Mulholland: The gentleman who has spoken last has voiced my sentiments. I think the anesthetics put the patient in position where he can be readily treated. One anesthetic

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has not been mentioned which is comparatively safe, and which gives sufficient length of time to remove the pharyngeal obstruction as well as the nasal obstruction, I refer to bromid of ethyl.

Dr. Rogers: The difficulties and disadvantages of nitrous oxid gas may be overcome by the addition of 8 per cent. of oxygen taken from another bag and inhaled at the same time. This plan has been experimented upon by Dr. Casselberry, of Chicago, and has been very successful. I have seen him operate a good many times with that combination. The oxygen prolongs the period of anesthesia very materially so that abundant time is given the operator to remove both the naso-pharyngeal growth and also the faucial tonsils, if desired. Another advantage of nitrous oxid is, that the patient is in an upright position, and it is a decided advantage to have him thus while we operate. When the patient lies on the table with his head down it is somewhat awkward for the operator, whereas wrapped in a sheet and sitting up, the patient is in front of you and much easier to operate on.

Dr. Würdemann: The discussion has mainly evolved statements of fact, so that not much remains to be said. Dr. Hitz's statement is correct; this is not a neoplasm but an overgrowth.

The dangers of this operation are to be avoided by careful examination of the patient, as we do in any operation, by detection of abnormalities, by the position of the patient, and by the method of anesthesia. The patient being under an anesthetic should not be operated on in an upright position, because pieces of the growth will be liable to drop in the larynx, and we then run danger of suffocation.

The patient's head should be low and kept to one side. There is an immense amount of bleeding in some of these operations, and it is very liable to be drawn into the trachea and to drown the patient if he be in an upright position.

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My ideas on narcosis are best given by reading the headings of the table I have given in my paper. Out of 189 operations of which exact record was made, 165 were operated upon under chloroform, but very few of these under profound anesthesia, the majority of the patients being children and the anesthesia being assisted by suggestion. There were only eight under nitrous oxid gas, and it seems to me that the nitrous oxid gas acts by the removal of the oxygen, or by supplying the patient with less oxygen, so that administration of oxygen with nitrous oxid would theoretically prevent rather than cause anesthesia.

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DIRECTIONS FOR PREPARATION OF GLYCERIN-JELLY AND MACROSCOPIC EYE-SPECIMENS.

BY H. V. WÜRDEMANN, M. D., OF MILWAUKEE.

(Ophthalmic and Aural Surgeon to the Milwaukee Children's Hospital; to the Milwaukee County Hospital for the Chronic Insane; Member of Committee on Ophthalmology and Otology of the Wisconsin State Medical Society, 1898; etc.)

For several years I have been saving enucleated eyes, making of them permanent specimens mounted in individual glass jars imbedded in formalized glycerin-jelly. My collection embraces many valuable and interesting specimens. I have been so often asked for directions for mounting these eye-specimens that I am constrained to give publication to the methods used, which are similar to those of the laboratory at the Royal London Ophthalmic Hospital, of London, England.

FIG. 1.—Lateral half of eyeball with sarcoma of the choroid, showing normal relations of the ocular structures and the tumor.

FIG. 2.—Posterior aspect of anterior half of eye, showing extensive destruction of ciliary region and lens with exudate in vitreous.

FIG. 3.—Lateral half of glaucomatous eyeball, causing sympathetic ophthalmitis; taking the form of glaucoma in the other eye.

FIG. 4.—Section of eyeball in post-operative hemorrhagic glaucoma.

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Following are the directions: Wash the specimen as soon as removed in cold running water to remove all blood and detritus; then immerse in 5 per cent. formalin solution (one part to eight of water) in which it should remain for two or three days; then change the solution, in which it may remain indefinitely until ready for mounting.

The gelatin is prepared as follows: 1 ounce best American gelatin (Gold Label), add 8 ounces of hot distilled water, soak for about twenty-four hours; then add the whites and shells of two eggs, place on the water bath and heat, with constant stirring until the coagulated albumen rises to the top, leaving below a clear liquid. Filter this while hot through filter paper or absorbent cotton and add 8 ounces of the purest glycerin and 5 drops of pure carbolic acid.

To mount the specimens: Wrap them first in waxed paper to keep out the moisture, freeze with ice and cut with sharp knife and place in tepid water to thaw; then place in 30 per cent. solution of glycerin and water for twenty-four hours; then after an equal length of time in a 50 per cent. solution of glycerin and water, when the specimen is ready for mounting.

Place the specimen in mounting cup after having drained off glycerin solution and pour glycerin-jelly, heated to melting-point, over the specimen, removing any air bubble by small pipette and allowing gelatin to harden, keeping specimen in position. Expose specimens thus mounted to fumes of formalin under bell-jar for twenty-four hours, which hardens the gelatin. Cement on glass cover with Freese's cementine.

The glass jars have been obtained from Chambers, Inskeep & Co., of Chicago, Ill.

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THE PRESENT STATUS OF ANTISEPTICS USED IN SURGERY OF THE EYE.

BY J. A. BACH, M. D., OF MILWAUKEE.

Professor of Ophthalmology and Otology, Wisconsin College Physicians and Surgeons.

The constantly exposed position of the conjunctival sac, together with a favorable temperature, sufficient moisture, and proteid matter enough to encourage bacterial growth, makes this organ the almost constant habitat of micro-organisms. Here they find many safe retreats into glandular openings and other recesses, and under certain conditions give rise to purulent processes. Under ordinary circumstances nature has, however, happily provided counteracting influences which prevent bacterial development to any dangerous degree. The abundant blood-supply of the eyelids and extra-orbital structures, assures a local vitality great enough to make at least improbable any serious invasion of pathogenic organisms into these tissues. On the other hand, the wonderful and perfect drainage of a healthy conjunctival sac, together with its flushing apparatus, the lachrymal gland, are ample to dispose of unusual numbers of bacteria in time of health. It is, however, not always so when through some cause or other these natural safeguards become in a measure debilitated.

In a large percentage of those cases where surgical interference is indicated we also find a concomitant defect in the power of the eye to protect itself from infection; hence infections without special precautions have often taken place. It is evident to all observers that since the general recognition of the principle of antiseptic precautions in operations on the eye, failure of good result through infection has been rare indeed. It is but recently, however, that it has been observed that germicidal agents, which are used with so much

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confidence, do not deserve the foremost commendation for reliability in procuring brilliant results in eye-surgery, and that, in fact, they often carry within themselves sources of the greatest danger to an operated eye, especially if the deeper and more delicately nourished structures are involved. Chief among these dangers may be mentioned the incidental irritation they produce if used in that strength that experience teaches as necessary to accomplish destruction of pathogenic germs. To destroy the enemy of good healing in his hidden recesses by chemical agencies has been proven to be practically impossible, without serious damage to the tissues, and thus lowering their vitality. Within the last few years many tests have been made to determine the relative value of chemical antiseptics used in the eye. In all these tests it was clearly shown that none of them, though used in a strong solution, would of themselves, chemically, render the conjunctival sac aseptic, and that the incidental mechanical cleansing was a factor far more efficient than the antiseptic used. In fact, irrigation and cleansing with normal saline solution proved just as efficient to reduce the number of micro-organisms and render the eye surgically clean as when antiseptics were used of a chemical nature. The point of the greatest importance was found to be the repeated cleansing by swabbing and irrigation combined, and the quality of the solution, whether a chemical antiseptic or distilled water was used, remained indifferent. Once thoroughly sterilized by a process of frequent swabbing and irrigation, mild antiseptics, such as boracic acid solution, etc., were sufficient to keep the surface in a surgically clean condition, while the stronger antiseptics would frequently set up irritations, themselves detrimental to the best healing. The nutrition of the cornea and all the media of the eye are so delicately balanced, that the slightest lowering of vitality will cause serious disturbances and thus invite infection which otherwise these tissues might have resisted. The stronger antiseptics are, conse-

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quently, used less and less, and nature's method of mechanical cleansing with the use of normal saline solution, or some other non-irritating solution, finds acceptance. In operations on the lids and appendages where nutrition is always good, the character of solution is not so material, and no harm could result from using even the stronger antiseptics. Here, however, though harmless, the stronger antiseptics are not necessary, as the excellent blood-supply in these structures is fully sufficient to guard against infection, provided ordinary cleanliness is practiced. It has been the practice with a number of prominent eye surgeons to wash out the anterior chamber after cataract extraction with a solution of boracic acid, or some other mildly antiseptic solution. But even these have been found in many cases to favor inflammatory processes and have, consequently, been largely abandoned for this special use. My experience has been that the quickest and most favorable healing, with the least amount of irritation, has been in those cases where the stronger antiseptics, such as $\frac{1}{2000}$ or $\frac{1}{5000}$ sublimate were avoided, and where normal saline solutions or boracic acid solutions were only used to insure surgical cleanliness by repeated irrigation and swabbing, after the more serious diseases of the lids and lachrymal apparatus had been removed by appropriate treatment. These cleansing processes were generally begun a few days previous to operating on intra-ocular structures. On the other hand, I have on different occasions found that a solution of $\frac{1}{5000}$ sublimate not only irritated some eyes considerably, but actually seemed to endanger good healing through such irritation. In this experience I am corroborated by many leading eye surgeons. A source of great danger to operations on the eye is the improper or insufficient preparation of the instruments and general surroundings. To act strictly in conformity with the best teachings, based upon bacteriological facts, we must give due regard to the influence of air currents and commotion in the operating-room in stirring up dust. No amount

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of attention and care can always prevent infection where these precautions are not taken during an operation. In the preparation of the operator, as well as the instruments, the ordinary rules of aseptic surgery should be strictly adhered to. Shortly before the operation, instruments can, with great advantage, be dipped into absolute alcohol and then thoroughly wiped under firm pressure with clean cotton wool, when they are placed in a concentrated boracic acid solution for immediate use.

The present tendency of the use of antiseptics in surgery of the eye is to discard the stronger and depend more upon obtaining asepsis by means of the weakest solutions together with mechanical cleansing. Experience and careful observation have proven this to be the safest and surest means of obtaining ideal results.

DISCUSSION.

Dr. Edsall: Dr. Bach has thoroughly covered the ground and leaves little to be said. The field of intra-ocular operations is such as to make it almost impossible to secure absolute antisepsis. The connection between the conjunctival sac and the nasal cavity through the tear duct leaves a pathway open for the entrance of pathogenic germs, do what you will to sterilize the sac previous to the operation. Therefore, I think that it is an unnecessary labor to attempt to use antiseptics in the conjunctival sac. Moreover, the antiseptics, as the doctor has said, which it is possible to use in the conjunctival sac, must necessarily be so weak as to be practically valueless. The preparation that is probably most frequently used as an antiseptic, is bichlorid of mercury in from 1 in 8,000 to 1 in 10,000 strength, and this, I think, is so very weak that its efficacy is more than doubtful.

The chief things necessary in a matter of this kind are absolute cleanliness of the instruments, operator, and surround-

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ings, and a thorough preparation of the external parts of the eye for some days previous to the operation, and care of the lachrymal apparatus and of the conjunctiva. This attended to and the proper preparations for the operation made, the operator has, I think, done all that lies in his power to secure a sterile field following the operation. To attempt to do more than this I think rather tends, as Dr. Bach has said, to increase the probabilities of inflammation, for strong antiseptics necessarily produce inflammatory reaction in the eye. The mucous membrane of the conjunctiva is so susceptible to irritation from these preparations, that it is to my mind a decidedly objectionable thing to use them. The doctor has, I think, given us a very satisfactory résumé of the field of antisepsis in eye surgery.

Dr. Bach: The use of antiseptics, as I have stated, if used strong enough to destroy the germs, is detrimental on the one hand, and on the other hand it has been proven that they do not enter deep enough to destroy the germs. There is another objection, however, to their use, and that is because they give us a false security. I believe infection often appears from this very fact. I think that infection frequently results from the fact that antiseptics having been used there is a feeling that surgical cleanliness was obtained through such antisepsis, which is not the case, as frequent experiments have proven. The fact is that the conjunctiva, the glandular openings, and many recesses and folds, cannot be sterilized in that manner, and it is necessary in order to obtain absolute asepsis, that every part be brought in contact with the solutions, to wash away the bacteria; and asepsis once obtained, the natural tendency is, in reasonable health, for the part to remain aseptic.

In reference to the washing of the anterior chamber, I referred to that only to show that the delicate structure and nutrition of those parts is so sensitive that even mild boracic acid solutions injected into the anterior chamber, produce

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sufficient irritation to cause inflammatory processes; and to draw attention to the fact that in that way there results lowered resistance; and consequently harm is often done that may lead on to poor healing and often unfavorable results, that might have been different if only the simpler methods had been followed. The manipulation required and the fluid used endangers our results and I do not justify such unnecessary interference.

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ON OCULAR AFFECTIONS IN PUERPERAL ECLAMPSIA.

BY C. ZIMMERMANN, M. D., OF MILWAUKEE.

In the text-books of ophthalmology and obstetrics, or in the treatises on the relation of ophthalmic to general diseases, no information is given on ocular affections in puerperal eclampsia. That ocular affections are expected in eclampsia, Zweifel (C. B. f. Gym. 1895, p. 1206) shows in the reports of his 129 cases of eclampsia in tabular arrangement, in order to give exact information on all conditions observed in eclampsia, by devoting a special paragraph to the question: blindness, yes or no? I, therefore, perused the incident literature of the last two decennia, as far as accessible to me, of which I shall in the following give a résumé in connection with the report of a case which, on March 2, 1895, I saw in consultation with the late Dr. J. Mendel, who kindly gave me the clinical history.

A woman, aged 38, for the second time pregnant, had the first eclamptic attack in the fifth month of gravidity in August, 1894. This was followed by eight fits on the same day, which were stopped by chloroform. Urine 100 ^{ccm} in twenty-four hours. Albuminuria. The patient was kept in bed for four weeks under milk diet, after which the urine became normal.

In October, 1894, six new attacks occurred. Her general condition became impaired, and gradually mental changes developed. The patient was not quite clear in her mind, was ill-humored upon questions, her memory impaired, she was apathetic and unable to walk. Her face was swollen and cyanotic. Urine 750^{ccm} per day.

December 24th she was delivered of a healthy, strong boy, no eclampsia during labor, which was normal.

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On the fourth day of confinement three attacks of eclampsia occurred, and on the 8th, thirteen. Urine contained some albumen. Her mind became more disturbed, apathy, loss of memory. On February 2, 1895, urine 1,000 to 1,500^{ccm}, no albumen. She complained of various ailments, as weakness of left side of body, numbness of tongue, but no actual paralysis could be ascertained. February 15th twenty more attacks followed. As she then complained of her sight, I was called in consultation on March 2, 1895, and found high myopia, staphyloma posticum, otherwise the fundus of both eyes normal. Vision not worse than formerly. Visual field of left eye contracted upwards and towards the temple, not of the right eye. Left pupil a little smaller than right, pupil lazy, reaction normal in both. No more eclamptic attacks occurred, but the patient became more and more apathetic and stupid. Sudden death May 21, 1895.

At the *post-mortem* examination I found a large focus of white softening of the left occipital lobe at the floor of the posterior horn of the left lateral ventricle. Microscopically it was gelatinous and contained detritus, corpora amylacea, and many fine blood-vessels, aneurismatic and sacciform, the appendices filled with red blood-corpuscles. Blood-vessels at the base did not reveal any changes nor was there any embolism or thrombosis in the larger branches.

An eclamptic attack closely resembles an epileptic seizure, from which, however, it is distinguished by its occurrence in pregnancy, or the puerperal state, and, as well as from convulsions from other causes, by the characteristic frequency and accumulation of the fits. Like the epileptic attack it is initiated by dilatation and reflex immobility of the pupils to light. This has been supposed, as the loss of consciousness does, to allow a distinction of eclamptic and epileptic from hysteric convulsions, but has lost its importance as a symptom of differential diagnosis, since recently Karplus, Nonne, Beselin, Hitzig (Berl. Klin. Woch., 1897, No. 7), and A. West-

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phal (*ibid.* No. 47 and 48), published cases of hysteria in which the pupils were either dilated or miotic, but immovable during the seizures. Westphal inclines to attribute this occurrence in hysteria to central (cortical) conditions of irritation or paralysis.

In comparing eclamptic with uremic convulsions the authors widely differ. Some consider both kinds as identical, others as different affections. And as uremia is only observed in nephritis, the former attribute the cause of eclampsia also to nephritis. Crosti (Jahresbericht d. Gyn., 1896, p. 708) calls the physiological albuminuria of gravidity a hyperfunctional albuminuria, and concludes from statistics that eclampsia is due to a disturbed function of the kidneys and is nothing else but a variety of acute uremia. Others, however, urge, as for instance Schauta (Lehrb. d. ges. Gynekologie, 1896), that in a large proportion of cases of eclampsia no lesions of the kidneys are found, and in cases of albuminuria the eclamptic disturbances are slight and transient, and finally that eclampsia is scarcely observed in severe cases of parenchymatous nephritis. Therefore, he considers the occurrence of renal affections in many cases of eclampsia rather as a secondary disease caused by toxines. Prutz (D. Med. Woch., 1897, No. 40; Vereinsbeil, No. 26), reported of 500 cases of eclampsia, collected from literature, 46 per cent nephritis, 11.6 per cent. chronic inflammatory processes, but esteems the renal affections rather as secondary than as the anatomical cause of eclampsia. According to Charles (Congrès internat. de Genève, 1896), who also takes albuminuria as an accompanying symptom of eclampsia, one case of eclampsia occurs in four cases of albuminuria, whereas Fehling (C. Bl. f. Gyn., 1893, p. 998) found the latter in 98 per cent. Probably albuminuria in eclampsia is a functional albuminuria, as very recently described by Praetorius (Berl. Klin. W., 1898, p. 312), caused by endogenous toxines from insufficient assimilation of nitrogenous

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metabolism (obesity, gout, diabetes) or muscular exertions, to which we must count the convulsions.

Zweifel (p. 1,244) maintains, that puerperal eclampsia has a well-defined clinical picture, which every experienced clinician may distinguish without hesitation from uremia and other forms of convulsions, as well as the anatomo-pathological condition. He admits, however, the occurrence of mixed forms.

As in uremia, the *visual disturbances*, observed in the eclampsia, are also of *cerebral character*, if we exclude the occasional hemorrhages and albuminuric affections of the retina (Herman, C. Bl. f. Gyn., 1893, p. 220). We, therefore, have to find out what *lesions of the brain* have been ascertained in *post-mortem* examinations of eclamptic persons, and, if secondary to affections of other organs, what is the pathological anatomy of eclampsia.

The chief organs affected are the kidneys, liver, spleen, lungs, and brain. Juergens (Berl. Klin. W., 1886, p. 519) found in all his *post-mortem* examinations of eclamptic cases, severe hemorrhagic lesions of the liver, due, perhaps, to mycotic affections of the portal vein. He attributes great importance to these changes, as the parenchyma is lacerated and detached by the hemorrhages and may enter the circulation by way of the hepatic vein, and may thus be transported into all regions of the body, causing embolisms. In the embolic foci he found fragments of liver-cells, fat, and white blood-corpuscles containing fat-granules and fat-globules. Fat embolism in the brain he saw very rarely, but in some cases of intrameningeal hemorrhages the capillaries were obstructed by hyaline masses which had caused the hemorrhages, yet the nature and origin of them could not be determined. Virchow (*ibid* p. 489) also observed fat embolisms in eclampsia in the capillaries of the lungs and the glomeruli of the kidneys, but never in the brain, although he especially searched for them, nor could he decide whether the fat originated in contusions of the

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external fat layer or that of the pelvis. Lubarsch (C. Bl. Gyn., 1893, p. 648) also sees the origin of all pathological changes in eclampsia in lesions of the liver, leading to thrombosis by hyaline masses and blood-plates in the branches of the portal and hepatic veins and further on.

In the *brain* almost all authors found hemorrhages of the meninges, cortex and central ganglia, embolism, thrombosis, secondary softening and edema. The hemorrhages varied from microscopical size to very large apopleptic foci and frequently caused death (Leopold C. Bl. Gyn., 1885, p. 43; Vincent, 1889, p. 302; Strack, 1890, p. 53; P. Müller, 1891; Loehlein, Herzfeld, Chrobak, Gerdes, Goldberg, Lubarsch, Pfannenstiel, Leusden, Schwab, Prutz). Schmorl (C. Bl. Gyn., 1891, p. 210) invariably detected them around thrombosed veins and capillaries. In his opinion they are produced by a toxic substance which acts on the walls of the vessels, rendering them especially frail, so that they give way to the blood pressure and become ruptured. Within the vessels he found the endothelial layer detached in form of membranes obstructing the vessels. In a later monograph (Path. anatom. Untersuchungen ueb. Puerperal eclampsia, 1893) he says that he constantly found multiple obstructions of blood-vessels with their sequels, and within the circulation large multinuclear cells which he claims to be placental giant cells, and Lubarsch confirmed these conditions. Schmorl believes that this occurrence is specific of eclampsia, and is due to an affection of the placenta. Thus, according to him, all pathological conditions of the organs found in eclampsia are produced by the coagulating effect of the placental cells, introduced into the circulation, upon the blood, or from other material from the diseased placenta which enters circulation with the same effect. Leusden, however, (Virchow's Arch. 142, p. 1) found such placental cells as emboli also in the lungs of septic, not eclamptic persons, and, therefore, contests their character as pathognomonic of eclampsia. He

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also noted edema and punctiform hemorrhages in the brain, but no cellular emboli or hyaline thromboses in the ruptured small vessels. From the severe histological changes found in the kidneys he concludes that these play the most important part in eclampsia. Vicarelli (C. Bl. Gyn., 1896, p. 1027) observed in two cases of eclampsia, thrombosis of the blood-vessels of the brain caused by peculiar hyaline globules, which had anatomical and chemical identity with those found by various authors in infectious diseases of man, as well as in animals, which had been experimentally infected.

Zweifel thinks that the cerebral apoplexies in eclampsia are no complication, but an essential feature of eclampsia, illustrating the increased pressure in the cerebral vessels, which is so immense that even the elastic blood-vessels of young individuals are ruptured. As a proof of the increased blood-pressure he mentions the therapeutic effect of venesection in such cases by reducing the blood-pressure. This has actually been confirmed by Ballantyne (C. Bl. Gyn., 1886, p. 239) who measured the arterial tension in puerperal eclampsia with the sphygmograph and found it enormously increased during the convulsions.

Although Zweifel (p. 1206) asserts that as yet no pathologist has in cases of apoplexy in eclampsia found capillary aneurisms nor changes of the cerebral vascular coats which might be attributed to nephritis, but multiple obstructions of the vessels of the brain, there are a few such observations: Massen *e. g.* (C. Bl. f. Gyn., 1893, p. 320) saw ectasiæ of the smallest blood-vessels of the brain. Pfannenstiel (C. Bl. Gyn., 1887, No. 38), reported a case of fatal hemorrhage from rupture of a varix of the size of a cherry stone in the left thalamus opticus, brought about by the increased blood-pressure due to eclamptic convulsions. Bouffe de Saint-Blaise (C. Bl. Gyn., 1893, p. 913) described a similar condition in the liver, viz.: varicose dilatations of the blood-vessels, and diffused

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hemorrhagic foci in all his thirty-one autopsies of eclampsia. The focus of softening in our case also contained numerous small blood-vessels, which under the microscope showed very large sacciform aneurisma-like ectasiæ, filled with blood-corpuscles.

In other cases the cerebral apoplexy was found in connection with atheroma of the arteries (Davis C. Bl. Gyn. 1891, p. 776; Raymond, Rose, Berl. Klin, Woch. 1898, p. 193).

If such anatomical changes of the blood-vessels exist, the more readily they will give way to the increased blood-pressure caused by the convulsions, hence, the numerous and large hemorrhages in such cases.

In regard to the etiology of these changes found in eclampsia, so many theories have been advanced, that Zweifel called eclampsia "the disease of theories." The microscopical conditions of the various organs in eclampsia bear a remarkable resemblance to those found in acute intoxications, as for instance yellow atrophy of the liver, multiple subcutaneous ecchymoses, etc. (Ahlfeld, Klebs, Stumpf), and chemical and experimental investigations of the last few years have rendered it most probable that eclampsia is due to an auto-intoxication of the whole organism (Bernheim, Bourchard, Olshausen, Woyer, Chrobak, Massen, Schaefer, Zweifel, Saft, Byers vander Hoeven, Schauta, Favre, Kollmann, Manton, Senlecq, Potter, Oni, Lindfors, Sundberg). Experiments on animals, made by Tarnier, Chambrelent, Bar and Renon, Ludwig and Savor, have shown that the blood-serum of eclamptic individuals is more poisonous and their urine less poisonous than the blood-serum and urine of non-eclamptic persons. Vollhard, at the instance of Fehling (C. Bl. Gyn. 1897, p. 244), repeated the experiments of Ludwig and Savor, but his results were not in harmony with theirs, so that he thinks that further investigations are required to elucidate this subject which Ludwig and Savor (*ibid.* p. 244) promise in the near future. Thus it has been concluded that

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eclamptic blood, from certain changes which render it more poisonous, must have a deleterious influence on the organism itself to which it belongs. Chemical tests revealed in the eclamptic blood, substances of intermediate metabolism and of regressive metamorphosis of albuminous matter, as kreatin, kreatinin, carbaminic acid, aceton, leucomains, toxins, and ptomains. From the observation that the breath of eclamptics smells of aceton, and their urine contains aceton, Stumpf (Duehrsen, Arch. f. Gyn. 1892–42, p. 527,) inferred that the convulsions and the eclamptic coma are due to aceton, derived from virulent substances from the fetus brought into maternal circulation, just as the diabetic coma has lately been attributed to it. By very recent researches Brieger and Uhlenhuth (Deutsche Med. Woch. 1898, p. 163), found the "organ-toxines" from individuals who died of uremic coma extremely poisonous, but their necrosis-producing blood-serum not more than ordinarily. Others found a quantitive discrepancy of the physiological elements of the eclamptic blood from the normal. Thus Kollmann (C. Bl. Gyn. 1897, p. 341), determined a greater percentage of fibrin, and an accumulation of globulines in the eclamptic blood which indicates a disturbance of the metabolism of nitrogenous matter, and explains the presence of kreatin, etc. He ascribes more importance to the very toxic non-excreted liquid globulines in the blood-serum of eclamptics than to the former, as globulines brought into the circulation of animals produce coma, convulsions, fever, diarrhea, and depression; that is symptoms very similar to eclampsia. If, as it very frequently occurs, pregnancy is complicated by renal changes, the excretions are more interfered with, and the accumulation of globulines increased, predisposing to the outbreak of eclampsia.

The genesis of these substances lies, according to Kottmann, in a transportation of waste products of fetal metabolism into the maternal blood, and by mechanical and nephritic disturbances their further metamorphosis is arrested.

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Delivery of the fetus and the beneficial effect of venesection corroborate this assumption, as after the latter the lost quantity of blood is made up by absorption of water, so that the blood is purified from the obnoxious substances and more diluted. The occurrence of eclampsia during the puerperium is explained by the disturbance of metabolism not having yet subsided and this is strengthened by the dependence of the prognosis of eclampsia after delivery upon the diuresis.

To the action of the eclamptic poison, the hemorrhages, thrombosis and embolisms found in the brain have to be attributed, as it causes frailty of the vascular coats which, yielding under the blood-pressure, become extended into ectasiæ and thinned and burst—spasms of the blood-vessels—and favors the coagulation of fibrin. If the resultant affections of the brain are not directly fatal, various brain symptoms may be observed, as hemiplegia (Schwab), aphasia (Brooks, Rose, Baginsky), loss of memory (Schwab, Geyl, our case), psychoses (Olshausen, Hoppe, Knapp, Senlecq, Schauta), and visual disturbances, as contractions of the visual field, hemianopia, amblyopia and amaurosis. If in a case of eclampsia with albuminuria and suppression of urine-excretion such ocular symptoms occur, they might be attributed to the uremic as well as to eclamptic poisons, although different, but similar in action. In such cases however, it must not be forgotten that the albuminuria usually is a *secondary* affection, accompanying pregnancy, which after delivery entirely subsides, as in our case in which eclamptic convulsions occurred in the puerperium, but the urine remained free of albumen, so that uremic poisoning can safely be excluded.

It has been supposed that the uremic or eclamptic poison acts directly on the ganglia-cells of the cortical visual centers, or by ischemia, hyperemia or local edema. Lehmann (Berl. Klin. W. 1896 p. 1134) for instance, in describing a case of hemianopia in puerperal eclampsia, asserts that never a macroscopic condition has been found in autopsies which

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could explain the functional disturbances of sight. Other cases of hemianopia and contractions of the field of vision, and attributed to uremia, have been observed by Pick, Schmidt, Dunnin, and one of hemianopia inferior, also with contraction of the upper portion of the visual field, in an eclamptic woman in which mind-blindness developed (C. Bl. f. A. 1888 p. 411). According to Pick (C. Bl. f. i. Med, 1896 p. 352) the uremic amaurosis is due to a toxic paralysis of both central optic paths. From some reason or other the one hemisphere may be more damaged than the other, so that, after the subsidence of amaurosis, hemianopia remains. An analogue for this is the occurence of uremic (motor) hemiplegia. In one of his cases of hemianopia he found a focus of softening in the cortex of the right second occipital convolution which was not caused by embolism. Therefore, he thinks that the uremia may exert a toxic influence on the vasomotors of the brain, causing necrosis of that portion or thrombosis of a vessel, with consecutive softening. In favor of this he quotes the analogous action of some poisons and the fact, that after uremic amaurosis, lasting impairment of sight may persist which can only have been produced by a cerebral lesion. In a similar manner explains Schanz (D. Med. W. 1896 No. 28) the transient amaurosis in pregnancy, and Heinzel (Deutschmann, Beitr. z. August Vol. 2, p. 235) the visual disturbances in the period of lactation, as neuritis caused by intoxication by toxic albuminous matter, as well as Eulenburg other neuroses, *e. g.* vomiting, in pregnancy. But the almost constant anatomo-pathological condition of the brain found in autopsies of eclamptics, as mentioned above, renders it much more probable that the poison acts by the changes of the blood and the blood-vessels which it produces and their sequels, the convulsions being the direct cause of the hemorrhages.

To be sure in our case the large focus of softening in the left occipital lobe could not explain the contraction of the

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visual field of the left eye outwards and upwards and the weakness in the left half of the body, but only one examination of the eyes had been made, so that by further tests probably more distinct symptoms might have been ascertained. The contraction of the visual field in our case I would rather explain as analogous to that found by Charcot and Wilbrand (Ueber Sehstoerungen bei functioneflen Nervenleiden 1892 p. 26) after hysteric, epileptic or hystero-epileptic seizures which are followed by psychical alterations, or as in other neuroses, in neurasthenia, chorea, melancholia or in nervous asthenopia after exhausting diseases, especially severe confinements, or finally it may be attributed to the commotion of the brain owing to the convulsions. Attention has been called to the fact by Wilbrand, that an especial search has to be made in cases of suspected hemianopia, to really ascertain its existence, as such patients generally are very listless and tire easily. Our patient was in such a condition: she had lost her memory and had become rather stupid, but the visual field of the right eye was normal and that of the left showed only the contraction mentioned.

The question arises, could we, from the anatomical condition of the left occipital lobe, have expected hemianopia in this case, since the age of the focus of softening indicated that it must have existed at the time of the examination? I think not. And in that respect the case is rather interesting as to the determination of the visual center. The focus was confined to the floor of the posterior horn of the left lateral ventricle in the occipital lobe. It did not spread laterally towards the radiation of the fibers of Gratiolet, but downward towards the lingual and fusiform lobes which, according to Nothnagel (C. Bl. f. A. 1888 p. 481), as well as the middle and inferior occipital gyri, have nothing to do with the visual center. The cortex of the occipital lobe was not affected, especially not the cuneus and the region around the fissura calcarina. Thus, although in the occipital lobe, it did not

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involve the visual center. In contradistinction an analogous case of right hemianopia in the lower quadrant observed by Anderson (C. Bl. f. A. 1889 p. 386) may be mentioned, in which a hemorrhage was found in the posterior horn of the left lateral ventricle, but with sanguinolent imbibition and softening of the surrounding lateral tissue and the angular gyrus as far as its cortex. A case of nephritis reported by Bouveret (C. Bl. A. 1887 p. 481) also belongs here, in which sudden total amaurosis was caused by two symmetrical foci of softening of the medial and posterior surface of both occipital lobes corresponding to Munk's visual center, probably due to embolism. P. Mueller (C. Bl. Gyn. 1891) found in a woman who died of eclamptic convulsions a hemorrhage covering the whole pons and another one at the right Sylvian fossa. The posterior portion of the left lateral ventricle was transformed into a cavity of the size of a small apple filled with blood. The borders of the cavity, extending into the cortex of the parietal and occipital lobes, consisted of lacerated tissue infiltrated with blood.

These anatomical changes of the brain in eclampsia show how important it is in such cases to make a very careful examination of the eyes, especially the visual field.

To sum up: In eclampsia we find chemical alterations of the blood and anatomical changes of the blood-vessels, which we have to attribute to auto-intoxication with globulines or products of regressive metamorphosis of albuminous metabolism from the maternal and fetal cells. The convulsions, owing to irritation of the convulsion-centers by these substances, produce commotion of the brain, increase the blood-pressure, leading to rupture of blood-vessels as well, as the auto-intoxication, by creating a tendency to coagulate the fibrin of the blood, entails thrombosis and embolism. The ensuing hemorrhages, foci of softening and necrosis of brain-tissue give rise to hemiplegia, aphasia, psychoses and, when involving the optic path, to visual disturbances, as amaurosis, amblyopia, hemianopia and contraction of the visual field.

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REPORT OF CASES. a. CONGENITAL OPACITY OF CORNEA. b. BILATERAL CONGENITAL FISTULA OF LACRYMAL SAC. c. GUMMA OF INFERIOR TURBINATED BODY.

BY J. STEELE BARNES, M. D., OF MILWAUKEE.

Congenital opacities of the cornea are either seldom met with or the cases are not reported, as from the limited amount of literature at my command I find but eleven published cases spoken of. Most text-books pass them by with the simple statement, that they are rare, but do occur. This is probably due to the fact they are anomolies easily explained, and for which nothing can be done. They are interesting, however, from their rarity and etiology.

As to origin, they may be divided into two classes, non-inflammatory or developmental, and inflammatory. The former are relatively more frequent, usually found in connection with other anomolies of the eye, and are more obstructive to vision, sometimes completely so, as in the case of Moulton's,[1] where there was a total opacity of the left cornea. Cases of this class are due to an arrest of development. The fetal cornea originally being opaque and acquiring its transparency by degrees, any arrest in this process of transformation would leave the cornea more or less opaque. The latter, those inflammatory in origin, are due to a fetal keratitis, and under this head I class my case, which was that of a little girl, aged 4, referred to me by Dr. Shimonek, and seen first on November 15, 1897, with a well-developed phlyctenular keratitis in both eyes. The mother informed me the child had never previously had any eye trouble. The little patient was scrofulous in appearance, with the characteristic notched central upper incisors of hereditary syphilis.

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On examination I found a grayish white opacity on the nasal side of the cornea of the left eye and the temporal side of the right, about half way between the pupil and sclero-corneal margin. These opacities were the size of the head of an ordinary pin. At first I was under the impression that I also had to deal with a beginning interstitial keratitis, but after the fourth or fifth visit, when the patient had become more tractable and passive, and I was able to obtain a good examination of the corneæ with a magnifying lens, I discovered that the opacities were in the deep layer of the corneæ, and the results of a previous inflammation. The mother stated that the "white spots" had been there from birth. Another peculiar fact about the case was that the irides did not respond at all to a 1 per cent. sol. of atropin. No stronger sol. was used. There was no sign or symptom of an iritis.

Judging, therefore, from the child's general appearance, from the previous history, and the opacities being in the deep layer, it is safe to conclude that the opacities were the result of a fetal interstitial keratitis, due to a syphilitic taint in one of the parents.

B. My second case, bilateral congenital fistula of lachrymal sac, was a little Polish girl, age 10, referred to me on March 5th of the present year by Dr. Hitz. The history given was that the fistulæ had been present from birth, and for several years past the child had been under long periods of treatment of the lachrymal sacs with different physicians, all general practictioners except one who was a homeopathic oculist. Examination showed epicanthus; fistulous openings on the sides of the nose a few mm below the internal canthi, in line with the nasal duct, that on the left being a trifle higher; a chronic purulent blenorrhea of both sacs; the lachrymal papillæ and canals pervious. Both sacs were abnormally large, and as near as I could determine, the fistulous openings appeared to enter about where the sac merges into the beginning of the nasal duct. Probing showed blind false passages,

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and apparently total occlusion of the nasal ducts. In fact, I believe the left one to be totally occluded, but through the right I was able to syringe a few drops into the nose. The parents being unwilling to follow my advice, I have seen nothing further of the case.

C. Mrs. S., age 37, referred by Dr. F. H. Hagerman, consulted me on January 31, 1898, complaining of epiphora of the left eye and difficulty of breathing through the left nostril. For two months or more she had been annoyed by the epiphora, soon after the beginning of which the difficulty of breathing through the nose was first noticed. The only other symptoms complained of were frequent headaches, and at times a deep gnawing or boring pain in the nose.

Examination revealed a compound hypermetropic astigmatism; apparently no inflammatory condition of the lachrymal tract, but a partial occlusion of the lower end of the left nasal duct; the left nostril totally occluded by what appeared to be a large, hard, fibrous polyp, almost protruding from the nose. By means of the probe, however, it was demonstrated to be the enormously enlarged end of the inferior turbinated body. The membrane was a deep red, tense and smooth, except where it came in contact with the septum, and there an ulceration could be made out, the edges of which felt somewhat more indurated than the rest of the mass. There was very slight indentation on pressure with the probe, and after a thorough application of a 5 per cent. solution of cocain there seemed no reduction in size; a slight amount of muco-pus was wiped from near the ulceration; a slight, almost imperceptible odor was detected, but this later on entirely disappeared.

The right nostril was in a normal and healthy condition. The patient had never noticed the least sign of a purulent discharge from the nose or naso-pharynx. The family history gave no evidence of cancer or tuberculosis. Syphilis was denied by both husband and wife and there seemed no reason

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to discredit it except the fact of two or three miscarriages during early married life. These, however, were all claimed due to accidents.

Being forced to adopt some diagnosis I concluded to consider it syphilitic; accordingly two days later, on Feb. 2d, I instituted energetic mercurial treatment and to prove or disprove my diagnosis, I removed a small piece including a part of the ulcerating surface with a Mackenzie snare for microscopical examination by Dr. Patek. Dr. Patek reported the specimen showed hypertrophied tissue with an acute inflammatory infiltration. Some of the blood-vessel walls thickened and their lumen occluded.

On the 16th I discontinued the mercury and began the administration of potassium iodid with the result that two days later I brought my patient to the point of salivation. The condition of the nose very rapidly improved so that on the 21st she experienced very little difficulty. By March 1st, the tumor-like mass had almost entirely disappeared, the nostril was freely open and absolutely no difficulty in breathing. The epiphora had been absent for some time. There was still a slight muco-purulent discharge and I removed a small sequestrum from the upper part of the turbinated body near its base. The potassium iodid was again ordered and everything continued smoothly until March 15th, when the patient returned and reported that for the past two days she had blown pus from her nose. Examination showed pus on the inferior turbinal. Washing out the nostril and by forcible blowing of the nose I obtained some pus, but more thick glairy mucus. Concluding the maxillary antrum had become infected, I washed it out through the ostium, getting a considerable quantity of pus and thick glairy mucus. There was no odor. Examining with the probe I discovered a hole through the inferior turbinated body. Passing the probe under the turbinal and then turning it upwards a little backwards and outwards, it passed up through the turbinal and

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into the antrum, either through the ostium or in its near vicinity. The antral trouble with treatment rapidly subsided and on the 31st there was scarcely any discharge.

What has been or what will be the ultimate outcome of the case I am unable to state, as the patient suddenly stopped treatment and it has been over five weeks since I saw her last. That my diagnosis of gumma is correct I would not positively claim, but I believe that the clinical history and treatment prove it to be the most plausible one to accept.

REFERENCE: *Journal American Medical Association*, Vol. XXX., No. 5.

DISCUSSION.

Dr. Bradfield: A few months ago a case consulted me in regard to the occlusion of the right nostril, of something like ten days standing. My diagnosis was a gumma of the inferior turbinated bone, almost occluding the nostril. It contracted very slightly under cocain. I questioned the patient and he admitted gonorrhea but not syphilis. Under the circumstances I thought he had better consult the physician who had treated him before. I sent him for consultation but heard nothing further from him, but had the gratification of the patient coming some time afterwards to pay his bill when I questioned him and he said he was all right. He said he had gone to the physician who gave him a little solution of borax and soda and washed the nostril, and it was all right. I looked at the nose and found apparently a large ulceration, and when questioned he admitted the physician had administered the general remedies and removed a portion of the turbinated bone which had not healed.

Dr. Hitz: This doubtful case of gumma of the inferior turbinal was seen by me with Dr. Barnes on one occasion just after he had first seen the case. I confess that at that time I was very doubtful of its being syphilitic in any sense of the word. The mucous membrane had not the appearance of gumma of the nose. The surface proximating the septum

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seemed to be ulcerated, although owing to the difficulty in pressing it away from the septum, the ulcerated surface could not be seen. We could merely see a sort of indurated margin that suggested an ulceration behind, facing the surface of the septum. At the time, in the absence of history of syphilitic infection, and with the absence of all clinical signs of syphilis, I was very much inclined to think it was more of the nature of a neoplasm, possibly an epithelioma. The history, however, was very much against this, but nevertheless the appearance of the nostril was very much that of an epithelioma, and I suggested to Dr. Barnes the removal of part of it and having an examination made. The examination showed conclusively that it was not an epithelioma, and he later told me that the clinical appearances had greatly changed, that instead of being a pale, edematous-looking tissue, it had become very much redder, more of a purplish-red, which would be more of a syphilitic appearance, and I presume that the changed appearance was largely due to the removal of some of the tissue arresting the pressure and allowing the blood to come into the parts. There was nothing in the microscopical specimen itself that would absolutely suggest syphilitic tissue, but the patient certainly made wonderful improvement under syphilitic treatment, and, I think, probably Dr. Barnes' diagnosis of her case is correct.

Dr. Barnes: I have nothing else to add. Really it was a very interesting case, and for two or three days it was very difficult to know what diagnosis to adopt, and what course of treatment to pursue. When Dr. Hitz saw the case it was two or three days after I had first seen it, and in the meantime the woman was menstruating. The paleness of the membrane at that time was probably due to that fact, because that was the only time the membrane had that appearance while she was under my care. At first I did not diagnose it as a gumma, although I thought it was syphilitic; but after I had found the loose sequestrum, and on probing discovered

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that there was a hole through the turbinal, I concluded that it had been a gumma of the inferior turbinated body. It was hard at first to diagnose whether it might not be antral trouble, but on close questioning and getting the history that could be drawn out, there were absolutely no symptoms found in the case to go by. The woman said, "Why, if I could breathe through my nose I would feel all right." That was the only trouble she complained of—very little pain except at times that deep, boring pain—almost nothing to make a diagnosis by.

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MYDRIATICS AND MYOTICS IN GENERAL PRACTICE.

BY J. A. L. BRADFIELD, M. D., OF LA CROSSE.

The number of cases seen by the specialist where vision has been either lost or greatly impaired by the non-use or misuse of mydriatics and myotics, suggests that a better understanding of such agents by the general practitioner is very important.

Certain poisons when instilled into the eye cause dilation of the pupil, and are known as mydratics—atropia, homatropin, duboisin, hyoscyamin, scopolin and cocain, being the most important. Cocain instead of paralysing the sphincter-muscle as the other mydriatics, causes mydriasis by contracting the blood-vessels of the iris, and hence may be used where other mydriatics are not permissible. Mydriatics, where used to any extent, also cause paralysis of the ciliary muscle, resulting in enfeebled or destroyed accommodation.

Other poisons, as eserin and pilocarpin, cause contraction of the pupil and spasm of the accommodation, and are called myotics. When the iris becomes congested it becomes broader, and the pupil correspondingly smaller; consequently the dilation of the pupil reduces the congestion of the ciliary region, which is so desirable in inflammatory conditions of the uveal tract. One important exception, however, should never be forgotten: never to dilate the pupil when there is an increase of intra-ocular tension, except by cocain.

The principal lymph-space of the eye is a canal in the anterior scleral region, encircling and anterior to the ciliary body, known as the Canal of Schlemm. The lymph from the

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anterior chamber flows through this canal into the anterior ciliary veins, and into the general circulation. If this canal becomes closed, the intra-ocular tension rises, the eye-ball becomes hard, and the condition known as glaucoma exists. The physician who is unable to differentiate between glaucoma and iritis should never use a mydriatic or a myotic.

Primary glaucoma is a disease of old age, seldom occurring under forty. It may be acute or chronic. Acute glaucoma is characterized by enlarged anterior ciliary veins, edema of lids, and conjunctivæ, shallow anterior chamber, pupil dilated and sluggish, cornea hazy and insensible to ordinary irritations, optic disc, when seen, cupping out to the edge, vision poor or absent according to the stage of the disease, pain in eye and especially in supraorbital region, and when severe, nausea, and vomiting.

Chronic glaucoma has the same symptoms, but in milder form, and often prolonged for years; but may be supervened at any time by an acute attack.

Traumatic or secondary glaucoma is caused by injuries to the ciliary region, and may occur at any age.

The lamina cribrosa is the weakest part of the eyeball, and a prolonged intra-ocular tension causes atrophy of the optic nerve in this region, the pressure of severe acute glaucoma often being sufficient to destroy vision in a few hours. The medicinal treatment of glaucoma is myotics; eserin sulph. gr. $\frac{1}{4}$ to 1 ad. aq. dist. 1 oz.: one drop in the eye often enough to keep the pupil contracted to about one-third natural size, and so kept till tension returns to normal, usually one drop instilled from two to four times a day sufficing. The more severe cases require surgical treatment. Unfortunate indeed is the patient, should a mydriatic be used instead of a myotic.

Iritis begins with photophobia, deep ciliary congestion, darkened iris and contracted pupil, cornea and aqueous hazy, often edema of lids and conjunctivæ, great pain shooting into the temple, especially in early morning, pupil on dilation

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usually adhering to anterior capsule of the lens and dilating unevenly. Treatment, mydriatics, atropiæ sulph. gr. IV ad 1 oz. being the one usually chosen. In mild cases one drop repeated a few times a day is often sufficient; but in severe and neglected cases it is often necessary to use stronger solutions, sometimes using the pure crystals. Atropia often sets up a conjunctivitis, when this solution may be used as an ointment; but its use must never be stopped until dilation is accomplished, or local or constitutional symptoms appear, when other mydriatics must be substituted, duboisin sulph. ½ of 1 per cent. solution being the best. As the inflammation subsides, less of the mydriatic will be required to keep up the mydriasis; but it should be maintained till the ciliary congestion has disappeared. Should the pupil be allowed to remain contracted it will become grown to the anterior capsule of the lens and cause occlusion, or where a large amount of plastic material is deposited, exclusion of the pupil, and blindness will be a result. When the pupil is occluded, the aqueous, not being able to reach the lymph-channel, presses the iris forward, closes the canal of Schlemm, and causes secondary glaucoma; and, unless operated, the eye is lost.

Mydriatics and myotics being powerful poisons, the precaution should be taken when instilled in any quantity to press on the lachrymal sac and prevent their passing through the nasal duct into the general system. Atropia, even in weak solutions, sometimes causes severe conjunctivitis and eczema of the face, when it should be discontinued. When general toxic symptoms occur, as dry throat, flushed countenance, quick pulse, fever, nausea, and delirium, it should be immediately stopped; and if more severe symptoms persist, hypodermic injection of morphin administered.

To summarize:

1. Mydriatics and myotics should never be used without clear indications.

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2. Mydriatics should be used in iritis, cyclitis, chorioidoretinitis, and keratitis, and when the pupil is small or not already dilated, after severe injuries to the ciliary region.

3. Mydriatics should never be used where the pupil is already dilated, or where there is any tendency to increase of intra-ocular tension, again excepting cocain.

4. Myotics should always be used when there is a tendency to increase of intra-ocular tension and the pupil is dilated.

5. Myotics should not be used where there is ciliary congestion and pupil already contracted.

6. In threatened or perforating ulcers of the cornea, if central, mydriatics should be used; if peripheral, myotics.

7. For dilating pupil for ophthalmoscopic examination use homatrophin 1 per cent. to 3 per cent. solution, as the effect soon passes off.

8. Cocain being an exception to the way of operation may be used to dilate the pupil where there is a shallow anterior chamber, or even high tension, in old people when needed for ophthalmoscopic examination.

9. Never use atropia in glaucoma.

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SOME CASES BEARING UPON THE PERIPHERAL CAUSATION OF EPILEPSY.

BY FRANK H. EDSALL, M. D., OF MADISON.

Almost since the dawn of history we find mention made, under various names, of the disease which we to-day call epilepsy. Of old it was described as a devil which had entered into and taken possession of the mortal shell of its victim, and the contortions during a convulsion were said to be the struggles of the devil to retain possession of its tenement. Not an unjustified fancy for an age when so much that was otherwise inexplicable was explained on the basis of the influence of good or evil spirits, for even at the present day it would not require the play of a very strong imagination to convince one that the unfortunate in the grasp of an epileptic convulsion, with his writhings and inhuman cries, was struggling with a demon.

Such fancies must, however, give place in time to the advance of scientific information, and in the two thousand years that have passed since the "Great Physician" cast out devils, we have learned, at least, that devils are not the cause of these attacks, but in view of the time and effort which has been expended all through that long procession of the ages, to the end that the mystery of this affection might be solved, exact knowledge of either its etiology, pathology or therapy is surprisingly small. With the hope, therefore, that some slight accretion to that knowledge may result, I take the liberty of presenting a brief account of a few cases of this disease, which have come under my notice in recent years, and beg leave to state in advance thereof that it is not within the scope of this paper to enter into a critical study of epilepsy.

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The first of these cases, M. H., aged 12, was the daughter of a prominent physician in the northern part of Pennsylvania. At the time I first saw her, some five years since, she was a fairly well nourished girl of about the average size and development for her years, with no special evidence of a neurotic temperament. Her father being a physician of more than usual powers of observation, was able to give me a very minute history of her case. There was nothing, so far as he knew, in his own or his wife's family history which could have any bearing upon his daughter's affliction, the history of which is as follows: Ever since the real work of school had begun in patient's case, some three years or so before, she had had, at times, evidences of epileptic seizures, increasing in frequency and violence with the increase in the amount of study demanded of her.

Decrease in the amount of study or removal, temporarily, from school diminished the frequency of the attacks but did not altogether abolish them. The period of their occurrence was somewhat variable, sometimes once or twice a week, again not more than that many times a month. Latterly the severity of the attacks had increased to such an extent that consciousness would be lost during their continuance. Certain factors in the case had led her father to think that patient's eyes might be in some measure responsible, and to determine this point he brought her to me for examination. Her general condition at this time was as I have described it. While not a robust child, her general health had not apparently suffered materially, and mentally she was on a par with other children of her age. The question of a possible hysterical factor in the case was considered, but her father doubted its possibility and it seemed safe to exclude it.

Examination of the eyes showed vision in both to be less than $^{20}/_{XX}$ and examination by ophthalmoscope, showed the presence of a considerable refractive error. Patient was given a mydriatic to use and further examination, with eyes

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under the mydriatic, gave a refractive error of +2.00s⌒−2.50 c. ax. 70° in O. D: +2.00s⌒−2.75c. ax. 160° in O. S. Glasses representing this were prescribed to be worn continuously. No abnormality of balance in the extra-ocular muscles could be determined beyond a slight exophoria, of about 3°, which was disregarded. I failed to hear from patient again for nearly a year, at the end of which time she returned to let me look her over. After obtaining the glasses prescribed she had worn them faithfully and with greatly increased comfort in the use of her eyes. For two or three months after their use was begun she had had slight attacks of her malady, but for some months there had been none. A maximum of out-door life was advised with as little study as possible for some time, with plain food and an abundance of sleep. Indirectly I heard, from time to time, that she was having no further trouble, but I did not see her again for nearly two years when, as she was suffering somewhat from headaches, I again tested her refractive state and increased slightly the strength of the cylinder for right eye and made, also, a slight variation in its axis.

After this change was made there was no further trouble. I have seen her once since then, last summer. She was then in perfect health, had had no convulsion since the few attacks in the interval immediately following the time when glasses were first worn, and was in every way a contented young woman.

Another patient, somewhat similarly affected, was Mary X— of Washington, Pa. aet 10. Her father gave a history of her having had several epileptic seizures within the year preceding her first visit to me. Patient's general condition was excellent. Rather large for her age, and while not of more than ordinary intellectual power was, still, not deficient. The convulsions were growing more severe and rather more frequent.

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No personal nor family history which seemed to have any bearing upon their causation could be elicited. Examination of eye-grounds showed no abnormality of fundus. Muscular state of eyes as near orthophoria as it well could be. Vision $^{20}/_{XX}$, slight hypermetropia. Under mydriatic she developed a hypermetropic astigmatism of 0.75 D. ax 90° in right eye and 1.00 D ax 90° in left eye. Glasses corresponding to this formula were prescribed and worn with such satisfactory results that when I next saw her, about a year subsequently, her father was able to report that there had been no convulsions in the interval. Patient then dropped out of observation for about two years, returning, however, late in the fall of 1897. At this visit her father informed me that during that year the convulsions had begun again and were nearly or quite as troublesome as previous to the first visit to me. Patient had grown decidedly fleshy in the interval but was in excellent health. Her menstrual functions had been established during the year and were regular and painless. It was impossible to demonstrate any change in the refractive state since the glasses had been prescribed nor was there any heterophoria. I was obliged, therefore, to say that the case had passed beyond my ability to relieve it. What the subsequent history has been I do not know.

The third case in this list is that of Mr. S., a school-teacher, from Indiana county, Pa., unmarried, aet. 28. The patient rather ill-nourished and dyspeptic, was run down in health from overwork. He had never, to his knowledge, had any epileptic seizures, but his history left little doubt but that he was a victim of nocturnal epilepsy, the bitten tongue and dullness and lassitude upon awakening making this most certain. He consulted me chiefly for relief from his severe headaches. His eye-grounds were rather red and woolly, his vision $^{20}/_{1}$. Muscular state; exophoria of 2°.

Under mydriatic his refraction error was found to be a myopic astigmatism of 0.75 D. ax. 90°. Glasses were

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given to correspond to this error. Six months later I heard through his cousin, the physician by whom he was referred to me, that his headaches were gone, his general condition improved and he gave no further account of having bitten his tongue during the night. This was some six years or more ago; what the course of the case has been since then I do not know.

The last case of the series, the one in which I expected to achieve most brilliant results, and in which I was most disappointed, was that of a 14-year-old boy from Washington, Pa. He had had for two or three years pronounced epileptic attacks of moderate severity and not especially frequent. He had, I found, a hypermetropia of 1.00 D. with an astigmatism of 0.50 D, in right eye and a similar error in left eye.

There was an exophoria of 5°. The refractive error was carefully corrected, the muscular balance adjusted and I composed myself to await the test of time as to results. I am still waiting, at least for anything favorable. It was four or five years ago that I first saw the patient. At the end of six months there had been no improvement, and then the parents began the wearisome round of all kinds of specialists with, when I last heard from the case, no improvement whatever.

The first two cases and the last one which I have brought to your attention bore the impress of genuine epilepsy. Both those first mentioned occurred in young girls, previous to, but near the period of first menstruation, the third in a boy about the age of puberty. All these cases showed a considerable degree of refraction error, the first one a high degree and troublesome form of error. All were about at that period of school-life when the work entailed is most confining and consequent mental activity increased and the resultant eye-strain most troublesome. The adult case I will briefly consider later on.

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With the history of these cases before us, what do they teach as to the causation of epileptic attacks? Epilepsy may be described as a nerve-storm arising from a central or peripheral focus, characterized by a more or less intense discharge of the motor nerve-cells as manifested by tonic and clonic convulsions, accompanied frequently by loss of consciousness.

With that class of cases where a demonstrable central lesion is responsible for the convulsive outbreaks, this paper has nothing to do, my consideration being limited to so-called idiopathic epilepsy. It is impossible, in the light of our present knowledge of the pathology of epilepsy, to say that epilepsy, purely peripheral in origin, ever occurs. It is most likely that all cases of it are dependent upon a central lesion of some sort, though this lesion may at times be so fine as to escape detection, and of itself, unable to provoke the nerve-storm characteristic of the affection, the peripheral neurosis then simply furnishing the determining factor in producing it. Under this theory, the excessive demands made upon the inhibitory cells, consequent upon the peripheral focus of irritation, in time exhaust them to a degree wherein they are no longer able to control the motor-cells which are in an unstable state, due to the (supposititious) central lesion. Then a great wave of motor nerve-force is let loose and, for the moment, inundates the sufferer.

These cells discharged, inhibition has time to recover control, and the unfortunate is, for the time, free from the convulsion.

In the first of the cases of which I have made mention, it is probable that the central lesion, whatever it may have been, was not deep-seated nor extensive, and that the relief from eye-strain and the establishment of the menses, which followed not long after, sufficiently lightened the burden of the central nervous system to admit of the restorative forces of nature repairing whatever trouble may have been at the bot-

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tom of the attacks, and thus the condition was permanently relieved. In the second case the condition which originated the convulsions was too permanent to be overcome, but was not, at the time the case was first seen, sufficiently extensive to admit of its originating the convulsions unaided. With this peripheral factor in their causation no longer active, the attacks subsided until the central lesion had advanced to a point where a peripheral determining factor was no longer necessary to produce the convulsion.

In respect to the last case, I need only say that, while from its character I was justified in thinking it more likely that a peripheral irritation was concerned in the outbreaks than in almost any of the others, yet at the time at least when I saw him, as the outcome of treatment proved, it was not in any way concerned therein. The third case was probably a mild form of epilepsy which, doubtless, followed the same course as did the first.

It is foreign to my purpose to take sides in the conflict which has been waged for some years between the advocates of graduated tenotomies in the treatment of epilepsy, and those who denounce them as false teachers and heretics. As I understand it the matter is somewhat like this: The tenotomists claim that graduated tenotomies furnish one of the chief, if not *the* chief means of relief for this appalling affliction. Their opponents decry their arguments and statistics as misleading, and the spirit of brotherly love takes flight when the two sides get together, so heated is the controversy.

The matter presents itself to me in this way: Asthenopia, due to refractive error, leaving out the question of whether it is causative or not, may at least determine an epileptic seizure. Muscular inequalities may produce asthenopia, therefore, why is it not possible for muscular asthenopia to determine such seizure? The tenotomists in many instances have ridden their hobby so hard that they have been unable to read the signs

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by the wayside. It is a well-known fact that with many epileptics it is possible to bring about a temporary improvement simply by a change from one medicine to another. Analagously, it is possible that a tenotomy would temporarily benefit such as these remarkably, and, moreover, it is just possible that, even as a few years since some apt simulators succeeded in convincing even as bright minds as there are in the so-called School of Nancy, that mental suggestion, hand in hand with the application of a bottle containing a given drug, would produce the characteristic effects of that drug, so also it is possible that the statistics in connection with tenotomies in the cure of epilepsy may be similarly impaired. Personally I do not believe that eye-strain from any cause is responsible for the status epilepticus.

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THE VALUE OF DISCUSSION IN MEDICAL SOCIETIES.

BY HENRY B. HITZ, M. D., OF MILWAUKEE.

The meagerness of discussion in our Medical Societies has seemed to the writer to furnish a topic well-worth dwelling upon, to the exclusion of one of a more technical nature. That justice can be done it in a short paper seems doubtful, but the mention at this time of a few pointed facts will not, it is believed, be *malapropos.*

The majority of the members present here to-day must have observed the brevity of the too few remarks often following some interesting and instructive paper, upon which its writer had spent days, weeks, or, perhaps, months, in preparing; who has come hundreds of miles to read this production, often glittering with gems of thought and fact, to have it fall with a dull thud upon apparently deaf ears, like a stone in thick mud, without one answering sparkle of thought or the slightest ripple of enthusiasm. Surely this is not as it should be in a society of earnest, educated, and intelligent men, who at other times show no perturbation at the center of speech.

Are we here merely to listen to the thoughts and experiences of a few other men, without contributing something of our own to the general fund of intelligence? Is our duty ended when we have finished the reading of our own papers? To be sure there are some contributions which either from extreme exhaustiveness or crudeness, preclude by their nature much discussion; but these are *raræ aves.* Very few indeed are those papers that do not contain some suggestions, some facts or experiences, which if developed by a broad and free discussion, would be of decided value to us all.

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Why then this brevity of discussion? Why this apathy of ideas? There are several reasons which would seem to account for this condition, first among which might be suggested a plethora of papers on the program, compelling a limitation of the time allotted for each. Perhaps, however, a more nearly correct reason is to be found in a general misunderstanding of what is to be discussed. We frequently hear the remark "there was nothing in the paper to discuss." From this it would seem that there is a prevalent impression that *only* the paper read should be discussed, and not the *subject*, of which the paper represents only an individual view. If this were true it would partake more of the nature of a literary criticism, than of a *pro* and *con* discussion of the technical subject, the underlying object of most medical brochures.

Another reason might be assigned to a lack of initiative amongst the members, partly due to a diffidence in addressing assemblies, but most probably from a feeling of unpreparedness, both of which by a little forethought and effort might readily be overcome.

Occasionally the presiding officer will show an undue haste in hurrying the meeting to its conclusion, generally in order to get through within the allotted time, but sometimes from a false view of avoiding "useless palaver."

There may perhaps be many other reasons, but to the few above cited will probably be assigned the chief causes.

Of the many benefits that result from a free and unlimited discussion of the papers presented, it is believed you will all agree. The writer is inclined to the opinion that at least 60 per cent. of the value of a paper is in the subsequent free discussion thereof. This is largely brought about by the emphasis thereby placed upon the salient features of the paper read, and by developing minor but important items perhaps overlooked by the writer. It brings to a focus the diverging rays of thought on the subject, emanating from various

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minds. Its tendency is to make more accurate the powers of observation, and to quicken the ability to state correctly the *results* of this observation. It helps to develop the reasoning and argumentative faculties of mind, which are amongst the highest of mental attainments, and it brings about an easy self-possession, which alone strongly aids in carrying conviction.

Viewing this question in another of its multi-phase lights, we are constrained to ask ourselves how it is possible to secure broader and more general discussion of the papers submitted to *this* Society. This can be accomplished in any of the several ways herein mentioned:

First: By limiting the number of papers, so as better to conform to the time at our disposal.

Second: By extending the time-limit for the reading and discussion of each paper.

Third: By making provision for the meeting of special sections separately, and at the same time. This it would seem must be the ultimate outcome, owing to the rapid growth of this Society.

Fourth: By previously appointing certain members to open discussion on certain papers.

Fifth: Each member should make it his duty to prepare himself, by gathering together his own experiences, or by reading up beforehand upon several of the subjects that may interest him more particularly, as their titles on the program may suggest.

Sixth and lastly: Should it appear after a moment or so that no one accepts the general invitation of the chair to discuss the paper just read, the presiding officer, by a few judicious remarks upon the subject, should endeavor to stir up discussion—and should this not succeed he should call upon some gentleman present to open discussion who should feel it his duty to acquiesce—if there is a possibility of so doing. Many other measures for the cure of this evil might be hazarded, but the writer feels that the suggestions herein made

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will be sufficient to impress upon all the necessity for some change for the better in this respect.

Believing the value of these meetings to lie largely in the free interchange of thought, let us then aim to have the papers presented, be they many or few, long or short, superficial or exhaustive, at least fairly and earnestly discussed.

DISCUSSION.

Dr. Edsall: The subject is of vital importance to any medical society. I think the effect upon the reader of a paper to have it fall flat, if the paper is worthy of discussion, is to say the least, unpleasant, and there is nothing so sure to kill interest in a medical society meeting as a lack of discussion of papers. As I stated earlier in this meeting, with the generality of papers the discussion which ought to follow should be at least as valuable as the paper itself. We have brought before the Society by the discussion, a great many points from a great many minds and very often there is a very great deal of interest in those points which are brought forward. The dread of occupying valuable time in the discussion is oftentimes a reason for not discussing a paper, but that, I think, is false modesty. Time ought to be occupied with discussion. I do not think it is a question that should be considered whether there is time for discussion or not. There ought always to be time. If there is not time the program should be so arranged that there will be time for discussion. It will be found that if papers are not properly discussed, the interest in meetings will wane, and with that waning a decrease of attendance will be noticeable at the meetings. In every medical society meeting there ought to be full and free discussion of every paper that is brought up, and if that is attended to you will find that the attendance will be very much greater and very much more enthusiastic than

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would otherwise be the case. The methods that Dr. Hitz has suggested for securing good discussion, are all of them valuable. The chief thing, possibly, that is of value, is to see that the program of papers that are to be read is not too long. We look ahead and see all the papers that are yet to come, look at our watches, and find the time is growing short, and we hesitate about occupying any time in discussion. Now, if the papers are more thoroughly culled out before the program is printed, and if necessary and desirable, an opportunity to print in the Transactions those that are not read, is given, simply reading them by title, and more time for discussion is thus gained, it will encourage members who are in attendance to more thoroughly discuss the papers; and then too, if it seems advisable, there might be some one appointed to open the discussion on each paper. That I think, however, is sometimes a method of questionable value. Whether it does stimulate to freer discussion or not I am not always sure, but at least it is worth trying, and the more thoroughly we make the effort to secure discussion, the more valuable our meetings will become.

Dr. Würdemann: The question of the length of programs has recently come to be a live topic in most medical societies and many of them are at work upon cutting down the number of papers. This morning I have inquired the sentiments of some of the men here present, regarding the length of our program for reason that in the secretary's report, I understand, there will be an important suggestion made regarding the duties of the program committee and the number of papers to be hereafter read before this Society. When we get to our business meeting this afternoon, a resolution will be offered limiting the number of papers and directing the program committee further as to their duties. A suggestion has been made that one-half of our papers be by invitation, coming from members of the Society who are especially invited by

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the officers of the several sections; that the men appointed on the several sections do not feel it a bounden duty to come and deliver a paper simply because they are nominated as chairmen, etc.; but they act as officers, and see that proper papers are obtained and proper discussion to each paper brought up. The other half, to be known as volunteer papers, are to be open to any member of the Society, but these are all to be in the hands of the Program Committee a sufficient time before the meeting, in order to pick out those papers which are most apropos to the meeting, and of the most value to us. Of course there is a chance that we will have some ill-feeling. Somebody will be hurt because his paper is not accepted, but if we have 50, 60 or 100 papers sent in, and 25 accepted out of that number, it simply shows that we have taken the best papers, the papers that are of the most interest to us for the particular meeting, and the other men can publish their papers elsewhere, or use them in their local societies. Bring up before this Society only matters that are of present and live interest, bring up papers that can be discussed, not statistical papers, but something that we are doing now, some subject that is open to question—those are the papers we want.

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PREVENTION OF NASAL CATARRH.

BY FREDERICK C. ROGERS, M. D., OF MILWAUKEE.

Professor Rhinology and Laryngology, Milwaukee Medical College; Laryngologist to Trinity Hospital and to Milwaukee County Hospital.

In the prevention of any disease, we must of course look to the conditions near and remote which are the cause of it, and eliminate them as far as possible. It is a recognized fact that in the majority of cases, the catarrhal process begins in early life and matures as age advances. Hence, whatever prophylactic measures are undertaken, they should, to accomplish the greatest good, be begun and followed out in childhood.

The nose and its accessory sinuses constitute a very extensive and intricate apparatus. It has very important and extremely delicate functions to fulfil, and upon the proper fulfilment of those functions, depends to a large degree our physical health. Any considerable change in its normal anatomical relations obviously means impaired function; and impaired function, altered secretion.

Children, as a rule, begin life with healthy noses, and the change from a healthy to a chronic catarrhal condition can generally be avoided by the use of proper clothing, the bath, attention to the digestive apparatus, exercise and fresh air, and last, but in no wise least, by such local treatment of the nose and throat as may be necessary to insure freedom of nasal respiration and drainage.

Exposure is inevitable, and we must prepare for it by increasing our resisting capacity, *i. e.* by accustoming our bodies to sudden changes. Too much clothing is worse than too little. Our aim should be to cover the body with light woolen underwear and outer garments sufficient to keep the cold out, but not enough to be burdensome, nor to induce

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even slight perspiration. Wool is by far the most hygienic material for undergarments and should be worn next the skin in varying weights all the year. It is light and porous and permits of thorough circulation of air, which insures dryness and gradual cooling of the body when freely perspiring from exertion. Woolen stockings and heavy-soled shoes should be worn during the cold and inclement weather of spring, fall, and winter, and the use of rubbers and overshoes abandoned.

People think to prevent taking cold by bundling themselves up, reasoning that by keeping the cool air out, they will escape having a cold in the head. There is no more pernicious habit than that of wrapping the throat in furs, large collars, boas, etc., for by their use, the resistance of that part of the body which is bound to be exposed at times, is lessened; the part becomes weakened through unnatural heat and the result is chronic catarrh. The daily use of the sponge bath or cold plunge is of the greatest value in preventing the development of nasal catarrh, as well as in its treatment. It is one of the greatest hardeners of the system that we possess.

Careful attention in the matter of diet and in the regulation of the bowels should be strictly adhered to. These matters are left all too often to the discretion of the child. Any improper action of the digestive tract is sure to intensify an already existing pharyngeal or nasal trouble.

Children should be kept out of doors as much as possible, rainy or windy days as a rule offering no objection. They should be encouraged to romp and run, and as they grow older, to engage in all manly sports, for by these measures do they unconsciously help to fortify themselves against future disease.

Children of school age are usually housed six hours or more of the day in over-heated, poorly-ventilated schoolrooms, breathing the already poisoned atmosphere over and over. I have lately been interested in making observations as to the temperature and ventilation of some of our schoolrooms. It

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is not at all uncommon to find from forty to sixty small children in a poorly-ventilated room, the temperature of which ranges from 70°F. upwards. The children have flushed faces, are inattentive and restless, and no wonder. It is a common complaint among mothers, that as soon as their children begin going to school, they have frequent and severe colds. They will continue to have them until we have teachers who understand and appreciate that the temperature and proper ventilation of the schoolroom are of vital importance, and mothers who will dress their children for comfort and health rather than for style.

What is true of the temperature of the schoolroom applies as well to many of our homes. Furnace-heated air, almost devoid of moisture, is respired again and again. It is this atmospheric dryness that so overworks the glands in the throat as to cause them to undergo hypertrophy.

Purulent rhinitis, so common and persistent among children, should receive continuous home-treatment. The value of such treatment can hardly be over-estimated. A soft rubber ear-syringe with a warm, alkaline and antiseptic solution, used two or three times a day, each time thoroughly cleansing the nose, and the frequent use of the handkerchief, (which should always be encouraged in children), will do away with the germ-laden, muco-purulent discharge, and allow nature to repair and strengthen the diseased membrane. Frequent office-treatments are necessary to insure perfect cleanliness and also for the purpose of stimulating the tissues to renewed activity by the use of local applications. In case there is no appreciable disease of the nose or throat, I think it wise to use a cleansing spray every day or two, simply as a prophylactic measure.

I believe mouth-breathing is rarely, if ever, a habit in the first instance, but rather a necessity. Every case of mouth-breathing should be examined to determine the presence or

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absence of nasal stenosis or adenoid vegetations in the vault of the pharynx, both of which require attention.

If the septum is deflected so as to cause narrowing of either passage, it should be corrected at once. Nasal stenosis will ultimately cause the over-worked tonsils to become hypertrophied, and very prone to acute follicular disease. Besides retropharyngeal and circum-tonsillar abscesses—which are frequently caused by entrance of the streptococcus through diseased tonsillar crypts—that common enemy of mankind, the tubercle bacillus, invades the cervical lymphatics through these portals, causing enlargement and paving the way for a general tuberculosis. All enlarged tonsils should receive careful treatment, either by extirpation or by destruction of the diseased crypts, which will render them less liable to inflammation.

DISCUSSION.

Dr. Hitz: There is one matter that I should like to mention which Dr. Rogers spoke of, but which I think might be dwelt on. The living in overheated houses is something of course that we cannot prevent in this region—you might say, in all of the north temperate regions; certainly all of the north temperate regions in the United States. It is not commonly supposed that every time during the winter season that we enter the house or the street, the nasal mucous membrane suffers an instantaneous change of temperature, due to the passage of warm or cold air. For instance, in the wintertime we are living in the house at a temperature of 70°F. to 80° F., when we suddenly step out into a temperature of 20°F. below zero. This necessarily causes an intense and sudden change of condition, and with all the consequences that follow, resulting in the various forms of hypertrophy. It is simply a point that I thought well to bring out more prominently.

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Dr. Edsall: The affection known as catarrh is one of the penalties we pay for being citizens of the greatest nation on earth. Not that I mean by this that Americans alone are afflicted with catarrh, but that we are much more extensively afflicted with it than probably any other nation, in fact European physicians speak of the prevalent type as American catarrh. There are a number of reasons advanced to explain why it is so much more widely prevalent here than elsewhere. Among them is the dryness of the climate, in the western portions of the country, the dust with which the atmosphere is laden, and also the fact that with the extremes of temperature which we have, the tendency has been to dwell in rooms, as Dr. Hitz has stated, which are overheated. Now it is not possible in a climate which is as severe as in some parts of this country during the winter, to dispense with a certain amount of heating of our rooms, but the tendency is always to unduly increase that heat. With a little more attention paid to the proper regulation of the temperature I think we could keep our houses, even in the severest winter weather, more equable than is now done, and by so doing we would diminish the tendency to catarrhal affections.

Again, a point which the doctor has mentioned, is the protection that can be secured in a large measure by the wearing of wool next to the skin. I think that this is a thing that is overlooked very commonly, particularly by women. Many of them, for some reason, object to woolen underwear, and it is often difficult to persuade them to put it on. It is a fact that the average woman is not clothed sufficiently at best, and it is, therefore, important to urge the use of woolen underwear. The cases of catarrhal affection would be very much lessened if that were looked after.

Then again, the improper ventilation of schoolrooms is an important item. The hygienic, or rather the unhygienic arrangement of the average schoolroom is a very unfortunate circumstance. The ventilation is usually secured through an

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open window. Now opening the window of a schoolroom means that a certain number of the scholars must sit in a draught, and that draught may produce chilling of the surface and a cold which, if neglected, will eventually become a chronic catarrhal affection. With a little more attention paid to lighting and ventilation of the schoolrooms, the number of cases that visit the oculist and rhinologist would be very much diminished, and this would more than repay any additional cost of school buildings by reducing the tax which now falls upon a great many parents, consequent upon the medical attention necessary for the eyes and noses of their children, resultant from unhygienic surroundings.

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ASTHMA.

BY J. P. THORNE, M. D., OF JANESVILLE.

It is not my intention to weary you with anything like a complete paper on asthma, but merely to give a few observations from my own experience.

In asthma there is a lack of physiological equilibrium of the nervous system. A majority of cases are due to some irritation of the vagus nerve, either its trunk or terminations. Holding these views in mind, asthma can be understood and treated rationally.

The places where the vagus is most frequently irritated, are its ramifications in the respiratory tract and in the gastro-intestinal region. Irritation in the respiratory tract is more frequent, and the nasal regions are the oftenest the seat of the irritation in the respiratory passages.

In treating asthma we should carefully study each individual case and not apply a routine treatment to all cases. Irritation should be sought for along the whole course of the vagus nerve; this irritation may be in the nose, throat, bronchi, stomach, intestines, or the heart may press on the nerve, etc. When we have located such a condition we have made a start toward curing the patient.

Those practicing rhinology find the nose a frequent source of asthma; polypi and hypertrophied turbinates being the commonest causes. I have found quite a percentage of cases can be cured by removing these pathological formations, but I have found many more that were not cured, but were greatly relieved, the paroxysms being less frequent and less severe.

I have seen patients suffering with asthma who had tried treatments and climates without relief, who had pathological growths in the nose, and when these were removed, a marked

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improvement or a cure was affected. I have had many cures by putting the nose in normal condition, but not the large percentage of cures that some claim. As the result of my observation I hold the opinion that a large percentage of asthma cases can be greatly relieved but not cured, and that a smaller percentage of cases are entirely cured by putting the nasal passages in a normal condition.

After removing such local causes of asthma, the general condition of the patient should be investigated. Any dyscrasia should be attended to and elimination be made as perfect as possible. It is necessary to establish the nervous equilibrium, aud two leading remedies for this are arsenic and strychnin; and I prefer them combined in the form of strychnin arseniate. This remedy used continuously and in full doses between the paroxysms will do much toward effecting a cure in many cases.

Potassium iodid justly has a reputation in treating asthma, but its irritant effect on the stomach often inhibits its beneficial action. The iodid which I prefer is calcium iodid, not the white iodid of the pharmacopeia, but the dark iodid of lime, which is tonic and alterative.

For the relief of the paroxyms, lobelia or its alkaloidal preparation lobelin, and hyoscyamin are valuable. Hyoscyamin every fifteen minutes will give relief by inhibiting the constrictor fibers of the vagus.

We want to cure and relieve our asthma cases by making a careful study of each. Remove as far as possible all local irritation and restore the nervous equilibrium, and the results will assure us that this distressing and sometimes intractable disease can frequently be subdued.

DISCUSSION.

Dr. Hitz: I agree with Dr. Thorne when he mentions nasal stenosis as being a very great factor in the causation of asthma. In fact, I think I go a little further than he does, for I am

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very much inclined to believe that nearly all cases of asthma show more or less nasal stenosis; that in many of those cases that have existed for any length of time, where the nasal stenosis has been removed as far as possible, the habit that has been acquired is largely accountable for the continuance. When the nerve-path becomes firmly fixed, it is extremely difficult to eradicate it, and when the habit of having these asthmatic attacks is formed, the slightest irritation in other regions may very possibly bring it about. I have found that the areas that Dr. Mackenzie has pointed out as being peculiarly sensitive, which exist in the nose along the posterior margins of the septum, along the vault of the pharynx and along the columns of the fauces, are frequently at fault. The complete removal of stenosis after it has existed for a long while, is almost impossible. That is because, as a rule, it has given place to some structural change in the size of the passage, and it is extremely difficult when this has occurred to remove it entirely. You may remove the turbinal bodies, the foreign growths, and sometimes take out a mass of bone, but you do not get the normal nasal passage, which is an extremely large and free space when the turbinal structure is in a normal condition.

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THE INFLUENCE OF DISEASE OF THE STOMACH UPON NASAL AND POSTNASAL CATARRH.

BY C. D. CONKEY, M. D., OF WEST SUPERIOR.

Since first nasal and postnasal catarrh have been studied, their causative factors have been the subject of many critical investigations.

Much valuable knowledge has been acquired in regard to them, but much uncertainty still remains as to their etiology.

Thus, in one of our latest text-books upon the nose and throat, the following sentence occurs: "The direct causes of hypertrophic catarrh have not been satisfactorily explained, nor has its very variable course in different individuals been altogether logically explained."

Its origin has been ascribed to many causes, but of necessity very few of them can be directly responsible for its development.

As secondary factors they have all had a powerful influence upon its course and termination.

My impression is that the true cause of hypertrophic catarrh and postnasal catarrh can always be ascribed to one or more acute attacks of inflammation which have failed to result in resolution.

When once inflamed these secondary factors at once come into play and largely determine the prognosis.

For instance, a nose greatly distorted by a crooked septum fails to furnish free drainage to the inflammatory products resulting from an attack of coryza.

Such a nose, continually clogged and bathed in an irritant discharge, heals slowly and often not at all; or the postnasal space, filled with a large surplus of glandular tissue and excessive blood-supply, becoming inflamed, owing to this

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peculiar anatomical condition, readily drops into a chronic inflammation.

The following are the principal causes enumerated by various writers: Nasal obstructions, vaso-motor disturbances, gouty and rheumatic diathesis, poor hygienic conditions, climate, dust, and atmospheric irritants.

They are taken from a number of recognized authorities, who mention them without laying any stress upon their primary and secondary relation to the disease.

Nor has any one of the factors named the prestige of being placed first by a majority of the writers, but each has its own advocate, who places it forward before the rest.

It, however, matters little what is the original cause of the disease when it is thoroughly established.

Each of the factors mentioned has a powerful modifying influence upon the course and termination of the disease, though some are of greater importance than others.

They must all be reckoned with, or efforts to give relief will be in vain.

Realizing the importance of recognizing all factors that exercise a controlling influence upon chronic catarrh of the upper respiratory tract, I am induced to mention a factor that has been exploited but little, which in my opinion has a very powerful effect in keeping up this disease.

In my study of catarrh from a clinical standpoint I have been impressed with the belief that there is an extremely close relation existing between it and catarrhal conditions of the digestive organs.

It is a noteworthy fact that the most universal diseases prevalent in the northern section of the United States, are diseases of these two sets of organs.

Gastric catarrh has been called our national disease, and nasal catarrh might well be called so.

They are coextensive, and are frequently found existing in the same individual, too often in fact to be a mere coincidence.

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It is more than probable that they are interdependent, one modifying the course of the other.

My reasons for believing that there is such a close dependence, briefly stated, are as follows:

1. Clinical cases of nasal and postnasal disease are apt to give a history of stomach-trouble, or at the time of the examination to show signs of such derangement.

Some are troubled by symptoms so mild as to be scarcely worthy of notice, such as a coated tongue, fermentation, and constipation.

Others will have such pronounced gastric symptoms that the patient unaided will trace a sequence between the two sets of organs.

The patient will often volunteer the statement that his catarrh is always worse when his stomach is troubling him most.

An aggravated case of gastric catarrh is very frequently accompanied by an intensely engorged nasal and postnasal membrane.

Hard drinkers, who have acquired the gastric catarrh of alcoholism, are very apt to reveal this condition in the upper respiratory tract.

2. Nasal and postnasal catarrh are invariably made worse by unusual stomach-disturbance. This fact I have observed time and again.

A sudden attack of gastric catarrh occurring in a person suffering from nasal disease will be accompanied by tremendous outpouring of mucus from the nasal passages, nor does the discharge decline till the stomach returns to a quiescent state. Another interesting fact in this connection is noticed. When the stomach again becomes quiescent, the discharge becomes much less for a time than it was previous to the attack, owing, no doubt, to the improved condition of the stomach following a period of enforced rest. An attack of hemicrania will often in like manner aggravate a chronic nasal catarrh,

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greatly increasing the usual discharge and also producing such engorgement of the turbinates upon the affected side as to produce occlusion of the nares upon that side.

3. It is a well-known fact that chronic pharyngitis and other pharyngeal troubles are largely dependent upon the stomach for their presence.

It would be folly to treat them locally without at the same time directing our therapeutic measures to this organ. As the pharynx is simply a continuation of the upper respiratory tract, differing but little from it, it is not at all unlikely that the upper part would always escape when the lower part is so often involved. It is true that some distinguished authors, most notable of whom is Bosworth, assert that the lower pharynx is part of the digestive tract, while the upper part is part of the respiratory, and that diseases of the stomach will affect the former, but never the latter. I do not believe that this statement is borne out by facts. If the pharynx is part of the digestive part only, why is it that it so readily becomes involved by extension in affections of the nasal and postnasal regions as he frequently admits in his admirable work upon the nose and throat?

My observations lead me to believe that the whole tract is intimately associated and subject to the same modifying influence, differing only in degree.

4. These cases improve under treatment directed to restoring the digestive organs to their normal conditions, and will not improve to any marked extent without correcting the existing digestive error, even though vigorous local treatment is carried out at the same time.

The above statements are based upon observations made upon a large number of cases and they are in line with the writings of a few prominent men, such as Beverly Robinson, of New York, and French, of Brooklyn.

I do not wish to convey the impression that all cases of catarrh of the upper nasal passages are accompanied by

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catarrh of the stomach, but I believe that the percentage is large of such cases. It is a factor that occurs sufficiently often to be always considered as a possible modifying factor and should receive the same attention that the other factors receive in the treatment of this disease.

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HOW TO PREVENT THE SPREAD OF ACUTE INFECTIOUS DISEASES IN OUR DWELLINGS.

BY C. H. MARQUARDT, M. D., OF LA CROSSE.

This subject is of so nearly every day occurrence, and one that we are constantly called upon to deal with, that it may seem rather presumpuous to present it as a special topic to a body of scientific and practical physicians; yet so important is it in the light of advanced preventative medicine, that we cannot as practical physicians review it too often, nor cease adding to our knowledge the improved methods and means that are constantly brought to light by scientific investigation. We are all unanimous in the conception that most acute infectious diseases are preventable, though we are not often in position to do so with the first cases; they come to us like other accidents that we meet with, no matter how careful we may have planned to avoid them; they are simply the accompaniment of life. In my student days not many years ago, it was taken as a matter of fact that in writing up the sick-history of an adult, the patient should have had all of the contagious diseases incident to childhood, and this is a question to-day in every report made for life insurance, "what illnesses or diseases have you had since childhood;" as though it was necessary to have had these diseases, or other than those inseparable from growth and development. It is to preventative or state medicine, the last child in our art and science, a mere infant half a century ago, that we are indebted to such progress as is at our command in dealing with, and preventing the necessity of so many children having to go through the list of contagious diseases. I presume that we are all agreed that no child is benefited by having had any of these ailments, and that they are no worse off for growing

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up without them, to say nothing of their suffering, resulting disabilities, and the losses of many of their number. The physician who by intelligent management prevents the spread of any contagious or infectious disease in a family where it has gained a victim, or who by hygienic measures alone, limits it to the patient so affected, earns for himself quite as much credit and respect, as he who by patience, skill, and frequent visits attends a number of patients to a safe recovery. Indeed, we might say that he who prevents disease is a greater benefactor than he who attends when necessity demands it. It is a duty we owe our patients, and to the communities in which we are active and have influence, to explain these truths and thus assist in educating the masses in that greatest blessing with which we, as physicians, have to deal, viz., health or preventative medicine. It has been the custom from time immemorial to hold in high esteem the physician whose reputation has gained for him the credit of coping successfully with disease, but, in my opinion, the day has come when he who can prevent even the lightest ailments by timely hints, ought to rank equally high. To come more directly to my subject, let us for illustration suppose we are called to see a case; as a rule the disease has established itself beyond the abortive period, and our duty is to make it as harmless as we can and limit it to the one affected. To accomplish this we remove our patient from the rest of the family, to a room suitable for the occasion, one that will admit plenty of fresh air and sunlight. These being nature's greatest disinfectants, we make use of them for the double purpose of aiding recovery as well as to weaken the germs of disease. In our endeavor to limit or prevent the spread of the disease, it is necessary to isolate the patient and the attendant to one apartment, and carefully care for all articles that are in use by either patient or nurse; to immediately subject them to boiling water when not needed. It is not my habit to send any of the family away from home. I prefer home-quarantine if

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you so choose to call it, neither do I remove any of the furniture, or whatever else may be in the room, if it is desirable to make use of such room as the patient is found in, for in all probability the disease-germs have been pretty well distributed, and it may be spread yet further throughout the house by the removal of some article being readily overlooked, when the last disinfection is applied, and so become a new center of infection.

It is of the utmost importance in managing contagious diseases to observe absolute cleanliness of the patient and his surroundings, and to immediately thoroughly disinfect any apartment in a dwelling from which a patient may have to be removed, as is so frequently necessary. In many instances, with our present methods of disinfection, this can now be accomplished with absolute certainty and with no harm nor inconvenience. It is of equal importance not to allow the recovered patient to mingle too early with the rest of the family, or other associates as the case may be, for we know that the germs of contagious diseases are oftentimes present for a long period even after ordinary signs of disease have disappeared. In case of death it is best to begin disinfecting as soon as the corpse has been properly taken care of preparatory to interment. This guarantees a measure of safety against infection to those necessarily needed in carrying out funeral arrangements, which in these cases should be unostentatious and within the time now specified by most Boards of Health. Another advantage this early disinfection has, is that the corpse itself can be to some degree at least rendered harmless. We, as sanitarians, have every reason to congratulate ourselves for having no longer to depend upon burning sulphur or many other agents equally difficult of application and questionable in effectiveness, in applying disinfection. The discovery of the germicidal property of formaldehyd gas or formaldehyd spray is an advancement in this line of sanitary work which

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is both easy of application and effective in results. One of the first medical health-officers to employ this agent in the form of spray on a large scale in room disinfection, and who demonstrated its reliability, was Doctor Mackenzie, of Leith, Scotland. In this country the agent is used in the form of gas, which, when properly generated, is equally effective. The apparatus used in the generation of the formaldehyd gas is obtainable at such low rate of cost as to be within the reach of every Board of Health, no matter how small their territory may be.

Every Board of Health should possess one of these generators; the health-officer in charge should ever have it ready for use, be perfectly familiar in operating it in the various contagious diseases, and soon then we might look in vain for diphtheria as well as other contagious diseases that have in times past spread and have been a terror to whole communities.

DISCUSSION.

Dr. Fuchs: I think that Dr. Marquardt should modify his assertions somewhat. If he claims that a child is better off, or as well off, that has not had measles, or scarlet fever, I think he is touching upon a questionable domain. As a matter of fact we do not know how far an attack of measles, scarlet fever, or any one of the infectious diseases immunizes us to yet unknown infectious diseases. It is positively established that it is quite likely that immunity acquired in the ordinary way against measles, also may immunize against other infections.

Dr. Marquardt: I have no reason to speak about matters beyond my knowledge, and my personal experience and observation have been that diseases of this character have not been an aid to the system, but have been antagonistic to the strength and welfare of the individual.

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VITAL STATISTICS AND HEALTH LAWS.

BY A. F. FUCHS, M. D., OF LOYAL.

If we look over any of the many fields into which medicine is subdivided, we are struck by the large amount of literary work that is being done. Much of this work bears marks of being mere copies, most of it is at best but compilations. Error, inaccuracies and untruth are thus copied and recopied, until the original source is lost. The incredible rate of speed at which we are pushed on, the rapidity with which events follow each other, tends to keep the average mind in a state of confusion. Under the best of conditions judgment is difficult, but it is next to impossible to form any judgment of the value of one or other of the many things daily called to our attention. In our desire to be with the crowd, or in the van, we enter into the mad rush after big and brilliant results, and we miss the gold that is being swept down with the tailings.

It is certain that the State has a right to gather vital statistics, consequently she may use all proper means towards that end. No truly enlightened nation should be without a record of some kind, of all births and deaths occurring within its boundaries. Such a record, if properly used, may be made to serve many other purposes beside giving information concerning the rate of births and deaths. The history of the people could be more closely studied, and the influence of environment upon body and mind, more surely established. In short, according to the data embraced in the records, we would be in a position to shed light upon many obscure points, and to a degree foretell, and possibly forestall, future events. The value of vital statistics to the State, to the student of sociology, history, and anthropology is certain. To my knowledge, the United States is the only country with some just preten-

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sions to enlightenment, which has no vital statistics. Naturally we ask, what is the reason for such a state of affairs? A sufficient answer would take up too much time, and is beyond the range of this paper. In my opinion, so long as the present system of filling public office obtains, so long will vital statistics not be realized, unless the function of gathering them is placed where politicians cannot meddle.

It is my intention to point out in this paper, first, what use vital statistics do not serve; second, to call attention to fundamental errors in our present law; third, to submit a rough plan of a vital statistics law for your consideration; and fourth, to make some remarks on health laws and health-boards.

Vital statistics are not medical statistics; the two differ fundamentally. It follows that vital statistics are of no use to the physician, as a physician. He cannot, from a study of vital statistics, say whether disease is frequent or infrequent in a given place, nor can he tell whether his profession has influenced mortality-rates for evil or good. Vital statistics are not a basis out of which something else grew; least of all could hygiene grow out of vital statistics. Sanitary boards and commissions are not, and never have been called into being by virtue of conclusions drawn from vital statistics. Quite the contrary, the data furnished by such statistics—so far as we know them—seem to confirm the view held by the best authorities, namely: that the birth- and death-rates are subject to immutable laws, and are not favorably influenced by the tinkering of health-boards or legislators.

Vital statistics alone, teach us nothing, they tell us much. They do not furnish unerring lessons of any kind, excepting only, that it is quite certain that a people is not "to be their own Sir John Sebright" in conditioning so much as numbers merely. As I said before, the physician learns nothing, and can learn nothing from statistics, which better qualifies him to act as a healer of the sick. Statistics are merely records

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of quantities, not of qualities. To a degree of course they record quality, as for instance: male and female, etc. These qualities, however, appear in the record only to bring out number. We are after the numerical ratio of males to females, whites to blacks, nursling to five-year or ten-year-old, middle-aged to very old, etc., etc. Hence, the physician who depends upon vital statistics for information as to the extent and character of epidemic disease, might study mortality-tables a century and be none the wiser. The uninitiated student, they are likely to confuse.

I have tried hard to imagine what benefit vital statistics are to the police in the detection and punishment of crime, but have failed to see any connection. Certainly a study of statistics, as also of geology and astronomy, will broaden the intellect, and thus better fit us, or anyone else, for the duties of a chosen calling. But that is no reason why I should advise a police officer to study birth and death records in particular. Neither can I see why we should be advised to go to these records for information on insanity, the neuroses, and degeneracy. It may be, that as we have been told nothing about degeneracy, and little concerning insanity, by the informed, a study of statistics can certainly not be more disappointing, probably less.

We, as a profession, are interested in all forms of disease; why then, it may be asked, are we not given some information on insanity by the medical men of our state and county asylums? It is a deplorable fact, that the fountains which are full to overflowing, yield nothing to the world of science, or to our art. Do not understand that Wisconsin is the only state that labors under such a condition of affairs; all other states are in the same rotten boat. Instead of setting an example, medical men slide along in the same easy, well-worn rut occupied by the politicians and the citizens at large.

I suspect it is now generally admitted that our last vital statistics law is defective. As this Society is the putative

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father, we should see to it that our offspring be quietly and quickly buried. All I ask is a burial-permit, it needs no death-certificate, as the monstrosity was still-born. How could it live presenting the following abnormalities precluding life?

That part of the law pertaining to deaths and burials, contains a clause providing that no body shall be removed without a permit, and that no body shall be buried or incinerated without a permit. Such permits are to be issued upon the certificate of a physician, coroner, or justice, and the certificate to be forwarded to the register of deeds, to be recorded. Now it frequently happens that the death occurs in one town or political corporation, and the body is disposed of in another. Hence would follow the necessity of two permits, one for the removal, the other for the burial. Each permit presupposes a certificate, hence two certificates. As these certificates form the basis of the mortality-records, a person dead, may run considerable risk of being twice dead and buried in an official way. The mortality-tables would be faulty.

Another defect is, that any physician employed by the health-officer, shall make out the certificate; if no physician is obtainable, then a justice shall make it out. Apart from the latitude allowed, and the concomitant vitiation of the statistics, and what not else, what is to prevent a doctor and the proper official from forming a silent partnership, and calling upon the town to pay a nice sum annually?

Another fault lies in the fact, that regarding the person who shall issue permits, the law is not mandatory. It is either the health-officer or clerk; hence persons in want of a permit must first find out who issues them. This little matter alone is sufficient to disturb the smooth working of any law, but a legally defective law it cripples past cure. Remember that a health-officer is supposed to exist in every town or municipal corporation, and the fact that he may not exist

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presupposes a neglect of duty. This law then, not only winks at a neglect of duty, but sanctions the same. The health-officer is an appointee of the board or mayor, therefore the majority of the citizens do not know who occupies the position. A man may drive twenty or thirty miles through slush and mud after a permit, and then be told that the supposed health-officer had not and would not qualify, and therefore could not make it out.

There are a number of general objections to the law, which, while not vitiating it legally, needlessly hinder, and make difficult and expensive its operation. First among these objections is the senseless repetition of the thing to be recorded. Note please that the maiden name appears three times, the color or race twice. Also items appear where they certainly do not belong, others are needlessly extended. Why, under age, extend it out to months and days, seeing that anyone interested can figure it out from the data at hand? Then there is the lack of concentration or proper grouping. The name, sex, age, color, cause, and date of death, etc., should be together and not scattered. The blanks are three times larger than necessary, unless they were specially designed to facilitate waste of State and private funds, and make prominent the faulty law which is printed on the back.

Going out from the principle that we must keep out of politics and party management with any statistics law if we desire results, I present the following for your consideration. The establishment of a statistical bureau, under the direct and absolute control of the State Historical Society, the Society to be given sufficient funds incidentally, to enforce the law by vigorous prosecution of the offenders. The town, village, or city clerk, to be the first depository of certificates. He to record them in a special book, to issue permits, and to forward the original certificate, or an abstract of his record, every sixty days to the State Bureau. At the close of the

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official year, he to send in a statement of the births and deaths by names only, for purpose of comparison. Permits to have clerk's seal attached, to go with body, be of force throughout the state, and to be destroyed when body is finally disposed of. Like permits from neighboring states, to be of force in this state. Let me close by saying, that there should be no compensation for certificates, and, that preliminary to the statistics law, cemeteries, etc., must be incorporated.

Incidentally to the main object of my paper, I thought I might touch upon our present health-laws, in order to arouse your attention, and if possible get an expression of opinion. It seems to me that the laws under which we work as health officials, should never have found a place upon our statute books. The health-boards as constituted under them are a farce; the officers are, as a rule, about as efficient as such officials were two hundred and more years ago. What Richard Mead said, 1715–20, may be applied to our present system. "Such methods," he said, "are inhuman, not just, and only serve to breed disease." And Sonderegger said at the Vienna congress of hygienists: "It is a fatal error to suppose that any, even the most carefully conducted operations of sanitary police, avail during an epidemic, if general hygiene has been neglected." "The control of infectious disease," said Hueppe, "begins and practically ends with the treatment of a given case. When these diseases become epidemic, sanitary police regulations serve no purpose; such epidemics are phenomena *sui generis*." Another authority said: "We do not need new editions, amendments, or reprints of old laws, health-board regulations and reports, but a thorough doing away with them, and a fundamental reconstruction." With these men I am in accord.

Year after year we are told by state health-board officials that they have abundant evidence on hand going to prove that good work is being done under their administration.

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Shall we accept all they say in good faith, or is it asking too much to demand a sight of the evidence? Officially they proclaim that "All is well," but the medical and secular press tells a different story. We are told that a National Board is needed, if anything like efficient work is to be done. We are told that smallpox prevails in one State, yellow fever in another, and that the national authorities must be called in; that no funds are at hand to isolate and care for the sick, or to feed the exposed; that the shotgun and club in the hands of the private citizen, the militia under the state authorities are in control of affairs.

The time at my disposal does not permit me to call attention to the innumerable senseless doings and utterances of the health-officers of our larger cities. Of the dumping of copperas into sewers to kill diphtheria germs, and the demand that vaccine establishments and stables be kept aseptic.

In closing, let me make plain my position, and what I contend for. I desire to see the State wherein I live occupy a foremost place in all things that I value. I value education, industry, good conduct, stable institutions and laws, justice, peace, frugality, and a fair measure of liberty. I value a proper administration of public affairs, and the general welfare of the people. Therefore, I consider it my duty to do what little I can toward a realization of my ideals. As my chosen calling and my daily studies qualify me somewhat to speak on that branch of the public service having to do with the gathering of vital statistics, and with state hygiene, I shall make it my special duty to call continued attention to the faults that obtain. So long as health-board officials persist in publicly, and at public expense, stoning germs with greenstone, and to have laws and regulations enacted that are structural malformations, and medieval pseudo-scientific vagaries, so long will I continue to call attention to a faulty system, and the work under it.

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DISCUSSION.

Dr. Marquardt: I am reminded somewhat by this paper, of what Mr. Elliott told us at last night's banquet. He said that the man who wanted laws made, wanted them, not for himself, but for the other fellow. I think the doctor occupies about the same position. He wants the laws made to suit himself and he does not care a thing about those that are in existence.

Dr. Coon: I am very much pleased with the paper just read. It is very vigorous and expresses some very pointed truths. I differ somewhat though, with some of the theories expressed, and especially with the point that vital statistics teach nothing to the profession; that vital statistics do no good from a medical standpoint, etc. It seems to me that a proper combination of a study of vital statistics with sanitary regulations is capable of accomplishing a great deal of good. I know from personal experience and observation that this is true. To cite one instance in this city. We had, up to five years ago, as we have at present also, a very large infant mortality in this city. About that time, however, under the supervision of Dr. Wingate, a systematic inspection of milk and dairies was commenced, with the result that the infant mortality in this city has decreased from year to year, until now it is but about 60 per cent. of what it was five years ago. Now that has clearly come about through a proper combination of sanitary rules and regulations and a study of vital statistics in this city. As regards the vital statistics law in force throughout the State, there are, as the doctor has very well expressed it, some defects that ought to be remedied at the earliest possible moment. We have had these matters called to our attention frequently by the refusal of various health-officers throughout the State to accept the burial-permits issued in this city, with the statement that, as the doctor suggested, a second death-certificate should accompany the body.

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Another matter which the doctor did not mention, is the collection of statistics in regard to births. The law at the present time requires that the parents of children born shall report these births to the local health-office. I have not the figures at hand to compare the results under the present law with those under the former law, wherein the physicians or midwife in attendance were obliged to report them, but I am of the opinion that when these statistics are collected it will be found that the births are not nearly as completely reported as formerly. It strikes me that that was not a wise change to make in the law; that under the old system, the reporting of births by physicans or the midwives in attendance, would conduce to a more complete record of births. I am very glad to be able to listen to this paper as it expresses, as I stated, some truths very forcibly and very sensibly.

Dr. Fuchs: I would meet the objections of Dr. Coon against my remarks as to the value of vital statistics by asking a question. First, let me apologize a bit for treading on the doctor's toes too roughly. My paper was intended to provoke discussion by attacking the position taken by Drs. Wingate and Coon, last year. How can we measure quality by a study of *vital* statistics and not medical statistics? Mind you, we have not got qualities on record, we have simply numbers recorded. The father of statistics, Suessmilch, who wrote in 1760, holds to this view and so do many others.

The physician has advanced. Are they not feeding sterilized milk? I rather think so. We have given up infant foods largely and are feeding sterilized milk. Our treatment of diarrheal diseases has been essentially modified within the last five years. Vital statistics tell you nothing about quality, but everything about numbers. You can prove anything by vital statistics that you want to, but you cannot prove that the mortality-tables of diphtheria have been

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immeasurably bettered by the use of antitoxin as a sort of vaccination, as was publicly given out. I shall object to such a use of vital statistics, and I am in accord on this point with all German and French statisticians and hygienists and with the leading authorities in America.

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SOME REMARKS CONCERNING SUITABLE TREATMENT BEFORE, DURING, AND AFTER SURGICAL OPERATIONS.

BY J. A. JACKSON M. D., OF MADISON.

That success does not always follow the work of those holding the higher seats in the synagogue, is too tritely known to require comment; and that brilliant, artistic operators are by no means always the best all-the-way-round surgeons is a commonplace observation. "Important as it is to become a dextrous operator, it is still of far greater importance to become a successful one. The object of every operation is the removal of disease that either threatens the life, or that interferes with the comfort and utility of existence. And the more certainly a surgeon can accomplish this, the better will he do his duty to his patients, and the more successful will he be in his practice. Success then, in the result of an operation, whether that result be the preservation of life, or the removal of a source of discomfort, is the thing to aim at. To this, dexterity and rapidity in operating are in a high degree conducive, but there are various other considerations equally or still more necessary, the solution of which can only be afforded by an intimate general acquaintance with the science of surgery and of medicine."

This excellent advice of one of the masters commends itself to our favorable notice. In truth, the most promising surgeon will be the one reared in an atmosphere of liberal knowledge of all the underlying principles of the art and science of healing in its broadest sense, and who possesses sufficient original breadth of comprehension to take in the perspective of the whole situation at a glance; one whose stock in trade is much more than mere technical familiarity. Neither his genius nor his talent may be of the shining order,

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but they serve to light up the mass of facts, and quickly discern where the seeming trifle ofttimes is merely the exponent of a high power. His mind is ever on the alert to receive a hint or catch a clue that leads perchance from a matter of detail to the discovery of an important governing principle.

The caution sign, warning against neglect of details, has long been posted on the field of surgery, but enticing pastures have oftentimes led to a disregard of the peril until overtaken by disaster. How often will it happen that a patient skilfully operated joins the silent majority, to the surgeon's mortification, who vainly seeks grounds for self-criticism in aught pertaining to the technique. Just how many victims have met their fate in consequence of disregard of previous inquiry concerning and rectification of organic or functional disease may never be known, but sad experience by way of shock, asthenia, intestinal paralysis and renal insufficiency, ought to prove a valuable instructor to teach us in future to prepare the subject for the coming ordeal.

Bacteriology has taught us, and as Bouchard and others have so well demonstrated, that the human body in health, and still more so when infected or disturbed, is a manufactory and storehouse of poisons, accummulation of which destroys health and may result in death, the only escape from which is secured by continuous elimination through the excretory organs. In short, either from actual increase in the blood or tissues of normal waste matter, or from accumulation of abnormal effete products, intoxication, in other words disease, is developed. These toxic agents found in the blood and organs are either mineral or organic, the latter being in part, at least, known as alkaloids, ptomains, leucomains, toxalbumins, etc. A toxic state may be the direct, or indirect, result of microbic invasion, or through ingestion of food, by either of which routes bacteria or their products are introduced from without.

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Toxicity may, however, be induced by accumulation of ptomains, leucomains, and similar organic poisons resulting from faulty digestion, intestinal changes, imperfect metabolism, impeded destruction or elaboration in the liver and other organs, or from deficient oxidation. The pathological process set up may be more or less acute or chronic. Often the disease is well-known and easily discriminated, as in the acute infections; sometimes however, it may be indefinite and "diagnosis–defying". There are of course many other conditions besides extraneous infection and autointoxication that bring about an undesirable undermining of health precedent to or at the time of an operation. Just how far purely nervous or psychic influence may beget a toxic or otherwise preverted condition is not known, but this and other etiological considerations will be noticed later.

To rush a patient onto the operating table, except in pressing cases, without previous preparation, savors strongly of the commercial spirit, and betrays ignorance of or indifference to propriety. Says another master of the art, "The preparation of a patient to undergo an operation is the first duty of the surgeon. Indifference on this point, except in cases of pressing emergency, argues great rashness and disregard of human life on the part of an operator". No reference is now intended, except to condemn, that ridiculous fetich which prompts timidity or fear to uselessly postpone operative measures because of some imaginary need of building up the system when the general failure is clearly the direct outcome of local remediable disease. Quite often there is misinterpretation of causal relation and an illogical conclusion, wherein action means rescue from imminent danger, while to wait will give the enemy securer foothold. To put off relief of pain and suffering, or the evacuation of pent-up products by timely action, is scarcely less irrational than delay in arresting hemorrhage. The truth is however, that the case must be rare wherein something in the way of rational medi-

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cation will not find a fitting application be it before, during, or after, surgical interference.

Not infrequently individuals live in a treacherous state of quasi-health whilst tolerating an amount of effete material not yet arrived at the explosion point, but illy adapted to bear additional strain, and susceptible to severe derangement from any disturbing influence. The lesson to be learnt from this is to inquire into the condition in every case, even of apparent health, and provide against all possible contingencies.

As this is not intended in the nature of a complete exposition of everything pertaining to this important subject, being merely a running commentary, it will suffice to briefly summarize the general principles involved, and allude to the main facts claiming the operator's attention.

He should take in the whole situation, allowing nothing to escape his scrutiny. If emergency demands immediate action, he must respond promptly with full comprehension of his obligations and duties, and a clear conception of the objects in view. To save life should always be the leading indication. Simultaneously with relief of shock, arrest of hemorrhage, vital support, and disinfection of parts may claim precedence. No matter how severe the danger, prompt, vigorous, skilful measures may turn the scale in the patient's favor to the unalloyed joy of the surgeon, even in otherwise hopeless cases. While the head is lowered and the feet elevated, what blood remains will be nearer the vital centers. Heat, both internal and external, stimulants, strychnin, digitalis, nitroglycerin, subcutaneous, intravenous, or rectal injections of sterilized normal salt-solution, may each and all be in order. Much will depend upon the judgment of the surgeon, whose responsibility is grave, with reputation at stake, as to what extent these means shall be carried before proceeding to operative measures. Sometimes it will be wiser to quickly advance into the enemy's camp, at others

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his time will be better spent in restoring his patient. These, and similar measures to maintain heat and support the vascular and nervous systems, will usually fulfill the leading indications in urgent cases with grave asthenia, such as the severer injuries from infliction of great mechanical violence, certain examples of intra-uterine polypi and placenta previa, attended with extreme exsanguination, or in rarer instances of operative labor with great exhaustion. In cases of puerperal eclampsia, in addition to physiological antidotal treatment of the severe toxemia and convulsions, decisive measures, calomel, elaterium, or croton oil, hot air or vapor baths, diuretics, perhaps digitalis, and at times bleeding, for the rapid elimination of the urea and other toxic principles, must precede, go hand in hand with, and follow manual or instrumental delivery.

In the severer accidental cases, whether the next indication be that of preserving the integrity of a member or an organ, or should a formal operation like resection or amputation be called for, the patient will, in the majority of instances, be better fitted for undergoing the ordeal.

But aside from cases prostrated by sudden profuse hemorrhage and shock, we often encounter a dangerous degree of asthenia from slow continuous flow of blood, loss of sleep, and sapremia or septicemia, wherein, nevertheless, nothing short of operation will put an end to misery and restore to health. Futhermore, on rare occasions we meet with innate tendency to bleeding in the hemophilic. These cases, in addition to such of the foregoing remedies as may be applicable, require special medication by way of iron, astringents, quinin, ergot, with possibly hypnotics. In cases of minor importance, after deciding on operation, with or without anesthesia, it is well, should time permit, to administer before hand a brisk cathartic to clear the intestinal canal of all fermenting and putrefying material. A few grains of

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quinin will tone the system temporarily, after which an anodyne to relieve pain or a soporific to procure sleep or allay nervous apprehension, may also at times be serviceable.

In anal, rectal, perineal, and vaginal operations, the catharsis should have been more thorough and the rectum well flushed, for it is very undesirable that early or numerous passages interfere with perfect rest and apposition of freshly-united surfaces, or that the wound should be so soon contaminated, necessitating frequent re-dressings. In genito-urinary cases of all parts of the tract, especially in those demanding subsequent catheterization, it is requisite in addition to making the accessible parts aseptic, to render the urine as bland, unirritating, and antiseptic as possible, by diuretics, salol, boric acid, etc.

In cases involving intestinal obstruction, strangulated external or internal hernias, intussusception and the like attended with fecal vomiting, previous lavage of the stomach economizes strength by lessening peristaltic action, retching, and vomiting. It may diminish distension above the strictured point. After the stomach and upper end of canal are emptied by the syphon-acting soft-rubber tube, subsequent use of mild antiseptic liquids will measureably arrest the putrefaction and reduce the danger of ptomain-poisoning. And for a somewhat similar purpose and in comparatively like manner, often to greater extent can copious enemata and free colonic flushing be made useful in certain conditions of the lower bowel as adjuvant to more serious procedures.

It is more to the point, however, of the subject in hand, to consider more *in extenso* the list of operations having for their purpose and object some great ultimate benefit to the patient in the removal of otherwise incurable disease, with preservation of life and restoration to usefulness and happiness. Types of these "operations of expediency" can be found in removal of the cancerous breast, lithotomy and litholapaxy, radical cure of hernia, resections or amputations

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in chronic disease of bones and joints, and intra-abdominal operations.

In these and such like cases, there is, as a rule, plenty of time allowed for suitable preparation of the patient, which should be one of the first duties of the surgeon, and for the neglect of which there ought to be no excuse, for there are occasions when no amount of skill will make up for this deficiency. He should, therefore, survey the whole field and take an inventory of all the facts pertaining to the case in hand, and whilst carrying out the general principles governing the usual course of making ready, he should seek carefully for, and meet any and all special indications. As a matter of course, climate, as a usual thing, cuts no figure for obvious reasons, save in very rare particular cases. Local conditions and seasons have more weight, for the house and surroundings may often be rendered more salubrious, and the operating-room and sleeping apartment made aseptic, and sometimes it may be better to postpone operation until more seasonable weather. But even the vicissitudes of atmospheric conditions may be tempered by ventilation, warmth, etc. In extremely cold weather the principal room must be kept at a temperature of not below 65° F. to 70° F., whilst during operation, liable to be attended or followed by shock, the degree of heat should be in the neighborhood of 80° F., or over. On the other hand, during the uncomfortable warmth of midsummer, ventilation, fanning, and cool sponging, will contribute to comfort and aid towards uneventful recovery.

During prevalence of any serious epidemic or endemic, it will be wiser as a usual rule to put off operations admitting of delay, for many individuals need but a slight coöperating cause like traumatism to succumb to an attack, and others apparently healthy may be less able than ordinarily to sustain the extra strain.

Likewise, if the patient be suffering from any intercurrent, unconnected affection of temporary duration, wisdom will

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prefer to withhold the knife until recovery. Furthermore, at times there may be acute exacerbations, directly the result of the ailment calling for interference, which latter can be more skilfully and safely managed after subsidence. Pyrexia can sometimes be lowered, inflammation relieved, and sepsis controlled by cathartics, quinin, etc., soothing applications, preliminary incisions or evacuations of pus, free irrigations, etc. Age, undoubtedly in a measure, comes in for consideration in more ways than one. Children we know do not bear the loss of blood well. The recuperative power of youth is a well-attested fact, but the sudden consciousness of life-long crippledom saps the ambition and sometimes defeats the surgeon, whose intense sympathy with consoling assurances, are then much in demand. Old people with damaged arteries, bronchial catarrh, and insufficient organs, neither bear anesthetics well, nor is there the buoyant hope of earlier years.

Women, if not over-corpulent, bear operations well, and they stand pain and loss of blood if anything better than men. Pregnancy bars out all interference, save when delay is more dangerous. A menstrual period, whilst not always a serious obstacle, is undesirable, the time of election being between five days after and about ten days preceding a period. Females are liable to hysterical manifestations, and seem to be more prone to post-traumatic delirium, partly because of the intrinsic nature of the operation so often required. Temperament, idiosyncrasy, and habits, influence results and may call for modification of treatment. In persons of extreme susceptibility and apprehension, the comforting assurance of an honest, confident operator will act as a tonic and allay fear. With such there should be no useless procrastination and a hypnotic should procure a previous good night's rest and sleep.

Over-eaters, and especially alcoholics, ought to be put on abstemious regimen, and the tendency to delirium tremens in the latter forestalled by bromides, diet, strychnin, and sleep. It is sometimes advantageous to institute preliminary train-

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ing in what will be required afterwards, as for instance use of crutches or wearing some appliance; and inconvenience and discomfort from inability to urinate or defecate can be measureably overcome by previous use of bedpan, etc. Rest and quietude of body and mind are essential in all cases, cheerful thoughts, hopefulness, and sound sleep are conducive to success. For this reason, except in trivial cases, it is advisable to keep patient in a properly prepared bed with aseptic surroundings a number of days anticipating operation corresponding to the magnitude of the latter. This is especially true of celiotomies.

The bowels should be thoroughly emptied, not in a perfunctory manner, but by alternate doses of calomel and salines, during the previous week, and for all intra-abdominal cases the intestine should be disinfected by safe antiseptics like charcoal, salol, bismuth, beta-naphtol, etc., that arrest fermentation and putrefaction, and transform this channel into an efficient drainage-tube instead of a dangerous cesspool. These and other stimulants to the liver will increase the destructive and reducing functions of this organ. After this the diet should be as strictly aseptic as possible, carefully selected and prepared.

"Any irregularities of digestion can be much better corrected before than after the operation. The convalescent from a surgical operation is often kept back and fails to gain strength because of gastric disturbances which might have been corrected beforehand. The same is true of the hepatic functions, any catarrh of the biliary passages, etc."

The skin should be aroused to its highest perfection by repeated full baths of proper temperature, the beneficial effects of which are numerous and manifest.

The condition of the lungs must be known by careful exploration. It will often be difficult to decide if it be wiser to operate or to decline, in view of existing pulmonary disease,

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or to determine if the latter or any other local disease has the right of priority in the causal relation. It must not seldom decide the question of general anesthesia, and the choice of the agent used.

The condition of the heart and vessels should be known and appreciated, for whilst cardiac disease is not often a distinct barrier against operation, cardiac weakness frequently demands extraordinary supporting measures, like digitalis, strychnin, nitroglycerin, etc., before, during, and after, operation.

Finally, and because the most important of all, the kidneys and the urine should receive serious and careful attention, for of all the organs the kidneys are the chief eliminators of the poisonous principles, that, but for their rapid and constant discharge with the urine, would accumulate in a short time to a point inconsistent with life. Indeed it might in truth be said that sound renal organs augur favorable results, whilst on the other hand the prognosis will be unfavorable in proportion to the renal insufficiency. Careful microscopical and chemical examination should have determined as nearly as possible their exact condition, and if proved to be below the normal standard, prompt and energetic measures should be started at once if operation be determined upon. Small doses of calomel, followed by salines will pave the way for the various diuretics, including digitalis and water. Too much stress cannot be laid upon this point, and it were better if all suspicious cases, after middle life, received prophylactic treatment along this line. Hardly less important is the bearing of the functional activity of these organs on the question of general anesthesia, particularly as to the agent employed. Whilst chloroform may kill on the table, ether too often follows its victims for a day or two after, who then die from suppression of urine and uremic poisoning.

After providing efficient means to prevent loss of blood

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during the coming operation, to guard against and overcome shock will claim equal prominence. Besides the measures before alluded to, heat, stimulants, digitalin, strychnin, nitroglycerin, saline injections, and transfusions, etc., often a sheet anchor of safety lies in a previous hypodermatic of morphin and atropin, which soothes whilst it sustains the system, and prolongs anesthesia with a minimum quantity of the anesthetic.

To leave a patient to his fate after operation is unwise. Vigilant oversight until the danger-point is passed, will often reap its own reward, and if it is judicious to put the system into proper shape to undergo an operation, and to sustain it during the latter, it is equally or nearly as needful to look after their interests subsequently and carry out a logical after-treatment. Rest and quietude of mind and body are all important. Should shock, anemia, or prostration, continue or follow, the same supporting measures, with elevation of the foot of the bed will be indicated. The functional activity of all the organs must be maintained as soon as reaction is well established, especially the all-important ones of elimination through the various emunctories. We may even hope in this way to rid the system of toxic conditions antedating operation, and induced by disease for which interference was required, and with good prospect of success, seeing that the cause no longer exists. After being kept well warmed for the immediate present, an agreeable or a suitable temperature should thereafter be maintained, as nearly as circumstances permit, and in hot weather frequent sponging, with ventilation. The bowels should receive more attention in the way of laxatives than is usual, and intestinal paralysis with all its distressing features of tympanites, constipation, dyspnea, and prostration may often be forestalled by early doses of calomel, salts, and enemata.

It is needless to add how much more uneventful will be the

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road to recovery, and how much more comfortable, when a proper dietary for the case in hand is enforced for awhile at least. No food whatever should be allowed for a time, and when vomiting and nausea are prominent and continuous, sometimes predigested milk should be given per rectum. These distressing symptoms often tax the resources of art to overcome. Circumstances modify treatment, but if vomiting continues spite of withholding fluids and food, there remain at command as may best suit the individual case, ice, hot drinks, aerated water, champagne, sinapisms, or even in desperate cases cocain, hypodermatics of morphin and atropin, or washing out the stomach. Quite often small doses of calomel, and effervescent salines pushed to free purgation, will put an end to this condition, from which time onward the stomach will tolerate small quantities of light nourishment.

Special indications with various modifications of the above and other measures will, of course, follow particular operations, and it is impossible to trace hard and fast lines bounding all cases. The essential fact aimed at in this connection is to enforce the necessity of a watchful supervision on the part of the operator, and a readiness to meet the indications as they arise. Above all is it prudent to pay serious attention to the kidneys and urine, and to seek diligently to discover if any existing symptom be due to toxemia from insufficient secretion, which is to be promptly relieved by purgatives diuretics, cupping, water by mouth, or enemata, or, perhaps, by normal salt-solution intravenous or subcutaneously administered.

This article applies, and these principles pertain to the general practitioner as much as to the surgeon, for the latter too often first sees the patient when it is high time to operate with little or no opportunity for preparation. Whenever the attending medical man decides that the case in hand

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proves to be, or is likely to become a subject of surgical intervention, in addition to making ready by way of preparing the room, water, utensils, etc., suitable for modern methods and the proper cleansing of the field of operation, he should put the patient upon the requisite medication for the attainment of the ends which it is the purpose of this paper to enforce.

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MODIFIED CRIMINAL RESPONSIBILITY.

BY W. F. BECKER, M. D., OF MILWAUKEE.

One might hesitate to approach the subject of criminal responsibility on which the last word is so far from being said, but there is scarcely a subject of wider interest and even a superficial invasion of it may be excusable.

Some writers [1] have said that the determination of responsibility does not come within the domain of the doctor; that while he is properly consulted as to the sanity or insanity of a person charged with crime, the responsibility of that person is a matter of law. It is true that the legal responsibility does properly take a large share in the destiny of the person, but the actual responsibility must always be a psychological inquiry and a matter of science, to which the legal view must in a large measure conform. Though the positive dicta of law in unsettled questions has much to defend it, unless it be granted that society has an undisputed right to inflict punishment arbitrarily, ignoring all moral responsibility, guided only by its own apparent interest without reference to abstract justice, then this view must be sustained and the evolution of law follow the evolution of truth...

The law has always exempted from criminal responsibility, infants, idiots, or lunatics, those committing unlawful acts by accident or under duress and the king. "Such persons can not commit crime", it says. Whether all these positions are well taken is not the scope of our inquiry, which will be limited to the one of chief importance viz: responsibility bearing on mental disorder. The ruling of the law here has had an interesting evolution following tardily the scientific unfoldment.

[1] Sir Fitzjames Stephen and others.

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At first the crudest ideas of responsibility prevailed. Immunity from punishment was conferred only when the individual was "totally" insane, as distinguished from "partial" insanity (which Mathew Hale, its expounder, likened to the understanding of a child of fourteen years and which, though discredited medically, served to differentiate obvious insanity from that which is not so obvious). Fifty years later Judge Tracy established the ruling that irresponsibility was granted only if the patient did not know what he was doing, "no more than a brute or a wild beast", derisively called the "wild beast" theory. Later a step in advance was made when the existence of delusions was regarded as a necessary condition of irresponsibility, *i. e.* where delusions could not be predicated no irresponsibility was granted. Later the "right and wrong" test of responsibility supplanted this. Exemption from responsibility was granted here if the person did not know the difference between right and wrong in the *abstract.* Still later the question of responsibility became the question of knowing the difference between right and wrong in the *particular act* which was the subject of inquiry. This "right and wrong" test was embodied in the famous answers of the English judges to the questions put by the House of Lords in 1843. These answers though justly and widely stigmatized since not only by medical men but jurists[2], and the subject of repeated evasion [3] or attempted reconciliation with broader medical views,[4] and in many instances replaced by more liberal rulings of a number of American jurists, are still followed in a majority of the states.

Thus it will be seen that the law has dealt decisively with this subject. At different periods it has treated each test as a fixed criterion of responsibility. It has thus assumed and sought for, some absolute principle of responsibility cut and

[2] Stephen's Hist. of Crim. Law, Vol. II, p. 163.

[3] Charge Justice Stephens, The Western Mail, March 15, 1888.

[4] Tuke's Dict. Psychological Medicine, Vol I, p. 316–317.

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dried. But when we step over to the other side of the question we see at once that the lines between responsibility and irreponsibility are not so well drawn. We see that there may be responsibility in the insane as well as irresponsibility in the sane.

We see, in short, what receives little popular or legal recognition, the relativity of responsibility. If disordered mental action guages responsibility as even the law recognizes, and disordered mental action is a relative thing—exhibiting degrees from sanity to obvious insanity, then responsibility too must be relative. Once committed to the relativity of mental disorder, the question of criminal responsibility in mental disorder can be shifted to that of criminal responsibility in general.

Dismissing questions of responsibility to a higher power, we limit our inquiry to that arising from man's relation to society. Society on the one hand is an ever-changing organization which, to maintain itself, requires certain activities and restraints from its units, man. Man on the other hand, a product of his evolutional history, is constantly engaged by virtue of evolution in attempted adaptation to his social environment, continually developing new activities which favor such adaptation and restraining old ones, the heritage of primitive mental states, which interfere with such adaptation. Failure in such adaptation to its best interests, society must look upon broadly as crime, and the individual who, by positive or negative conduct thus defaults, it must broadly regard as criminal. Certain consequences ensue from such failure. Natural (?) ones which visit the individual and are in the nature of remorse, humiliation and the usual train of evils which follow in the "way of the transgressor," and artificial ones which society applies (the natural ones being insufficient to protect it from injury). These latter are intended to (a) punish the individual (b) to deter him and others (c) to protect society. Public opinion takes jurisdiction over the subtler

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failures, the grosser ones are codified into and controlled by the law. Society thus demands of its units responsible conduct. In taking this attitude it assumes the free-will of the individual to do or refrain in its interest. Such nicety of adaptation, however, is but imperfectly attained by the individual. There is, therefore, in reality no such thing as absolute responsibility, as there is no such thing as absolute health or absolute sanity. It is conditioned. On the one hand by the capacity of the individual to *exhibit* the favorable and *inhibit* the unfavorable activities, and on the other hand by the pressure of his environment (chiefly) to effect such exhibition and inhibition. The exercise of man's best activities and restraints, while no doubt they are largely organized and automatic, seem ever to require this *pressure.* It is furnished partly by motives from within him, but chiefly by his environment with its complex incentives in the nature of fears and favors (rewards and punishments). Without this *pressure* he is ever prone to fall into lesser restraint and initiative—into atavistic traits. Men rise to their highest achievement under it and sink to their worst without it, as races fall into barbarism when removed from civilized surroundings. So necessary is this pressure to arouse or restrain conduct favorable to society that we constantly supplement it by adventitious aids as, for example, when we use the rod to arouse the defective activities of the lazy boy or the bucket of water to restrain the automatic ones of the hysterical girl. It is scarcely possible to overestimate the power that this pressure bears on conduct. It goes to the very heart of responsibility, for the act of the criminal is often a quasi-automatic one which by supplementary pressure at the right moment would have been averted. There is thus this play between society and the individual, the *pressure* of *environment* pitted against the capacity of the individual to adapt himself, that constitutes his measure of responsibility.

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Responsibility is not thus a *fiat* of the will as so largely assumed. Though the pure automatists have had more polemic than practical bearing, it is incumbent that we recognize more than we have done, the reaction of a particular mind to surroundings as we unhesitatingly do the body functions—that circumstance is king. This does not preclude all choice, for as stated much of conduct springs from organized moral sense and will, still it is more largely the reaction of the given individual to environment. Indeed it is this reaction which organizes the moral sense and that even this organization is sadly disturbed by changes which take place in the individual (changes far short of obvious mental disorder) or his environment, the history of civilization abundantly shows.

When we turn these views, if they be true, upon the legal tests of responsibility we see how arbitrary these tests have been. We see indeed how impossible it is to frame a rule of responsibility. We see how far the widely applied "knowledge of right and wrong" test fails in justice, for to grant irresponsibility only where the person charged with crime did not *know* the act was wrong at the time of committing it, takes no cognizance whatever of the power of restraint and turns the question wholly over to the reason, which is subordinate in most acts which have an emotional background even in the very sane. The inference that we are capable of avoiding conduct, because we *know* it to be wrong, is negatived by our common experience. It involves the assumption that with the *knowledge* of right and wrong goes *ipse facto* the power of *doing* the right and *avoiding* the wrong. If most persons could *do* right in the measure that they *know* it—if the knowledge of right lay in the efferent nerves, the pedagogue could soon perfect the world. Practically, too, this "right and wrong" test miscarries. For while there are ten persons who did not know that their criminal act was wrong, and by virtue of not knowing are irresponsible according to

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the law, there are ninety persons just as plainly insane who *do* know the criminal act to be wrong, yet who are just as irresponsible by all data except metaphysics.[5] "Man is responsible to do that which he *can* do, not that which he *feels* or *knows* it *right* to do."

Of equal invalidity are the "delusion" tests which are in wide use. These are to the effect that to confer irresponsibility, the delusion must have a direct bearing on the crime and that the crime which springs from a delusion, must have its responsibility adjudicated as it would if the delusion were true. For example, a man acting under the delusion that another is about to take his life kills this person, he is not punishable as acting in self-defense. If, however, he kills this person, acting under the delusion that he was damaging his character or fortune, he *is* responsible for that would not excuse the crime if the delusion were true. Here it is assumed that the exact delusions are always ascertainable, that they are not concealed as is often the case, that the exact relation of the diseased portion of the mind to the crime, can be separated from the healthy portion, the data for which inquiries would have to come largely from the insane person himself. And it is further presumed that a man acting from an insane delusion can act *reasonably* in respect to it, thus implying that the reason is disorded by virtue of the delusion yet not disordered by virtue of his ability to adjust his conduct properly in regard to it. All power of control in the *execution* of the act is again here ignored. Such assumptions are purely metaphysical,[6] however expedient or convenient

[5] Says Dr. Bucknill of large experience: "I remember but one case of a lunatic who did not know the nature and quality of the act charged; a maniacal woman who was so mad in court that she was unfit to plead".—*Am. Journ. Insanity*, Vol. XL., p. 42.

Also "Wherever any manifestation whatever of mental action can be adduced, the feeling of right and wrong may be proved to exist." Bucknill Criminal Lunacy, p. 51.

[6] Based upon the metaphysics of Locke.

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they may be for the law. But metaphysics in insanity has more than once turned justice into a rope.

It is true there have been higher achievements in the law than these tests. In a number of the United States more liberal views have come from judge and jury, approaching the broader continental treatment of the subject.[7] Thes have been in the nature of the repudiation of the "right and wrong" test as an exclusive one, and some recognition of controlling power as an element in responsibility,[8] the admission of a debatable border-land between sanity and insanity,[9] between responsibility and irresponsibilty,[10] a repudiation of the delusion test of the English judges,[11] a disposition to recognize mental disease without *conditions* an exculpatory plea.[12]

There has, however, been very little or no recognition of the relativity of responsibility. Rules and tests usurping questions of fact, often prejudging a case have had supremacy. These have failed to cover a modified responsibility which exists in truth, however difficult to determine—a modified or limited responsibility by reason of mental conditions of the offender. The world is full of persons with arrested or decadent mental functions, who are not within the pale of insanity or obvious mental disorder, and who by their very

[7] The German code says: "An act is not punishable when the person at the time of doing it was in a state of unconsciousness or disease of mind by which a free determination of the will was excluded." The French code has it: "There can be no crime or offense if the accused was in a state of madness at the time of the act."

[8] Parsons *vs.* State, 81 Ala. 577. Bell's Med. Leg. Studies, Vol. II., p. 16, Med. Leg. Journal. Also State *vs.* Fulton, 25 Iowa 67. "An uncontrollable and irresistible impulse arising from insane conditions of the mind relieves responsibility." Also Blake *vs.* State, 21 Ind. 433.

[9] 10 Fed. Rep. 161.

[10] State *vs.* Richards, 39 Conn. 591. Also Judge Gildersleeve's charge in case of Mrs. L., Witthaus & Becker Med. Jur. Vol. III., p. 240.

[11] State *vs.* Jones, 50 N. H. 369.

[12] State *vs.* Pike, 49 N. H. 399.

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structure are unfitted to adaptation and responsibility. These include numerous "borderland" cases so-called, also lesser degrees of imbecility with defective moral sense, also individuals with strong hereditary insane traits, all of whose power of inhibition is in structural defect, and who commit crimes under relatively slight causes, often without special motive, and in the face of swift and certain punishment.[13]

Perhaps the law cannot easily compass such modified responsiblity, yet it must ever seek to do so in approaching justice. It has had some recognition already where juries take cognizance of extenuating circumstances, where measure of guilt has been reduced by drunkenness,[14] where guilt has been gauged in persons who at the time of their offense were roused by some great religious or political excitement, and in somnambulism.[15] Exceptional cases have been accorded the broadest treatment in this respect, as in case of a person who was confessedly neither idiotic nor insane, who was tried for burning a barn. In charging, the judge took the measure of responsibility which he likened to that of a young child,[16] and another who was acquitted on the ground of being of weak intellect, and having no reasonable control over his actions.[17] Juries and judges have gone beyond this in weighing responsibility and have taken into account the weakness of human intelligence as contrasted with the force of impulse or passion. The case of Mrs. Lebkuchner[18] is one in point.

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[13] It may be said that we here arraign the criminal. Inasmuch as a large percentage of so-called criminals come from this class, if we are to preserve a distinction between the structurally defective and the criminal, we must recognize it from our standpoint to be, that one is capable of being deterred by such *pressure* as his environment furnishes, and the other not.

[14] Wharton Criminal Law, Vol. I, p. 54.

[15] Fair *vs.* Com. 78 Ky, 183. Austin Abbott. "A brief for trial of crim. cases," N. Y., 1888, p. 334.

[16] State *vs.* Richards, 39 Conn. 591.

[17] S. W. North Insanity and Crime Jour. Mental Sc., Vol. XXXII, p. 16.

[18] Withaus & Becker Med. Juris. Vol. III, p. 233.

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Mrs. L. was indicted for the murder of her two children in 1888. She gave "Rough on Rats" to three of them, but one survived. She was thirty-six years old and a domestic, married a man over twice her age, who had daughters as old as herself. Her husband became a drunkard and she never got along with his daughters. She had two children by him, when he deserted her, leaving her in debt and pregnant with a third child. She attempted to find him, but his children interfered with the success of her search, and she was soon after left upon the streets, with her two children, in poverty, without money, home, or friends, and pregnant. She then fell ill herself and was treated at the hospital for syphilis, and soon after her third child was born. In 1888 her husband died and she lived on and off with another man, also a drunkard, by whom she had one child, and in 1887, less than a year before the tragedy, she found herself again pregnant. About this time she injured her side by an accident, and her syphilis manifested itself by a facial eruption and brain-symptoms. She was approaching the end of pregnancy, had the morbid symptoms common to women at that time, her condition was aggravated by lack of food and hard work, harrassed and crippled by pain in her side, she had the firm conviction that she would not survive her coming confinement. She was living in rooms for which she paid $8.00 a month, was paying $3.00 a month on a sewing machine, and trying to support her children, she could barely make ends meet. Sleepless nights spent in anxiety as to their fate, rendered her worse. She would worry during the night thinking what would become of them should it rain on the morrow and prevent her work, for she never could make up for a day that was lost. Whenever the pain in her side returned, she could not work or sleep. The great New York blizzard came about this time and made matters worse, and she entertained thoughts of ending it all for herself and her children. On the Friday before the crime, sick and unable to work, she

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had fallen asleep on the lounge; when she awoke she found the children looking at her and crying. When she asked them why they cried, they said that they had supposed her dead. This made a great impression upon her, and having a conviction that she would surely die when her baby was born, for she had never before suffered such pain as she had now, the idea of killing herself and children came again to her. She fought it off again, but when a short time after she was taken with symptoms that suggested approaching confinement, the thought again took possession of her. She could not sleep, she "cried and prayed" all night, she felt that it was better that she should kill the children than that she should die and leave them behind. So after a troubled night she sent her child after a box of "Rough on Rats." She put all the powder in a teapot and made four portions, one for herself and each of her children. She passed it to them, told them to drink it, which they did, but she could not look at them, and turned away faint. She did not take her own portion, as she feared that she might die first, and she was not cowardly enough to leave them to suffer without some one to look after them. Two of them died, and she put them to bed. She watched over the third a number of hours, and when he fell asleep and would not miss her, she ran to police station, told them what she had done, and asked them to send a doctor, whom she wished not for the purpose of saving her child, but to relieve his sufferings. She was calm, made no excuse, showed no remorse. She still believed the child would not recover, and that she herself would die. She had not looked upon this as a crime, but thought that they would all soon be together in another world.

Here is a woman with strong hereditary predisposition to mental disorder (her sister an inmate of an insane hospital) with syphilis, probably involving brain (numbness, some loss of power of one side, and pupillary symptoms) with pregnancy and its morbid fears, with no delusions, except ill-de-

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fined ones, that she should die during her confinement, great mental depression, not fit to work yet working, suffering from a severe injury to her side, sleepless and harassed by poverty and want, seeing no hope for the future but starvation for herself and her children, kills them as the best solution of her difficulty. Though she was without hallucinations and illusions she was in too poor a physical condition to appreciate clearly the nature of her acts or to resist the impulse which impelled her.

Though this case very ill-fitted the conventional tests of insanity or responsibility that were applied, she was properly acquitted of guilt.

The following case is here briefly quoted to indicate the kind of case in which a modified or limited responsibility should be granted.[19]

A. B., aet 45. At the age of puberty showed signs of sexual perversion in that he yielded to an impulse to expose his sexual organs to young girls. He was ashamed of it immediately. He had graduated from a university in Germany and had good opportunities from his social position and friends for advancement in life. Again guilty of a like offense he escaped to England where his ability as a teacher soon secured him a good position. Here the anxiety for his livelihood being relieved the same impulse seized him and despite his knowledge of the necessary results to follow and the disappointment and shock to his friends who had aided him, he was again guilty of a similar offense. Coming to this country he was again successful in securing an occupation and gained the respect of all, his mental disorder not being suspected. After all strain and anxiety of establishing himself had been removed, the same impulse presented itself and he again exposed himself in a public place to little girls. Ordinary sexual intercourse gave him no relief nor was the same pleasure experienced. He was perfectly cognizant of his crime against

[19] Witthaus and Becker, Med. Jurisprudence, Vol. III, p. 271.

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order, bewailed his condition, threatened suicide and said that, though he were to have been killed the next moment, he could not have controlled the act.

Here was a man apparently refined and educated, in full reasoning power, with knowledge of the nature and consequence of an act. Every motive for not doing it existed. Desire alone and that of a morbid nature will explain it. Surely the law should recognize some limited responsibility in such a case.

The law may properly deem it inexpedient to look with laxity upon responsibility, for fear of encouraging a pretext of irresponsibility or insanity in those charged with crime. But one cannot escape the conviction that the law has gone to the other extreme in this regard. The pages of jurisprudence teem with instances of the conviction and punishment of insane, irresponsible, mentally sick men, and they make very solemn reading. While one responsible man escapes on the pretext of insanity, ninety-nine insane and irresponsible ones are punished. This is the reverse of an old and revered maxim. Surely expediency should not weigh so heavily against justice.[20]

Nor are the evils of the insanity plea insurmountable. Persons acquitted of guilt on the ground of insanity should be subject to detention for the public safety, if not also for their own good. Such detention is better accomplished in states which have institutions for the criminal insane than in the hospitals. There could also be a minimum of detention exacted, having some correspondence to the term of imprison-

[20] During the past twenty-five years 40 per cent. of the murderers apprehended in New York state have been confined in asylums. At least 30 per cent. were insane before their crime.—E. H. WILLIAMS, *New York Medical Journal*, April 19, 1898. (When we take into account cases in prison in which insanity is not so obvious, also those insane who are convicted of lesser crimes than murder, for in felonies of a lower order unsoundness of mind is seldom raised, we can understand why chains, irons, and the camisole belong to the armamentaria of prisons. See Report International Prison Congress, 1895.

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ment for the particular offense. Thus society could accomplish its protection which is the wholesome end of all punitive treatment, and the deprivation of liberty would incidentally be a punishment, which could have whatever deterrent effect there may be in it. Experience in New York shows that it does not pay there to resort to the insanity plea. The average length of confinement in prisons (including life sentences) is only a trifle over two years. On the other hand the average length of confinement of insane criminals is over four years, twice that of prison life. The aim of the lawyer being to get the minimum sentence for his client in case of conviction, he is chary of advancing the insanity plea.[21]

Lastly, the law should unhesitatingly confer irresponsibility where the individual is obviously insane, whether the crime was the offspring of his mental disease or not. Though it may be true that the fact of being insane may not have predicated irresponsibility in all his conduct, what problem is more perplexing than the determination whether the disease did or did not affect the act? And can there be any question that where the disease exists the offender should be given the benefit of the doubt as to his responsibility, especially when society may thereby still be protected?

DISCUSSION.

Dr. Fuchs: I hate to see the paper go by without discussion. I do not quite catch the idea whether or not Dr. Becker would have matters so arranged that the physician should take cognizance of crime. That is according to Dr. Flint's suggestion, that crime is largely a disease, or the result of disease, and that the physician should handle criminals as they do their sick. If he takes that position, and I hardly think he does, I think he is going a little too far. But, I believe he occupies the same ground as I do, a middle ground. I do

[21] *Ibid.*

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not think that we can classify certain men anthropologically as being criminals and degenerates, by viewing their skulls, features or habits, while we classify others as being perfect men. As a matter of fact one man, if he is properly trained, may become a very good soldier, another, an excellent financier, and still anthropologically considered he is a criminal, that is, his tendencies if not put in the right direction, would lead him to crime, ultimately. That is the middle ground and the view held, I think, by Huxley.

Dr. Becker: I take the ground that the criminal, if he is not directly a subject for the physician, is a subject for scientific study, coming more closely into the field of the physician than into any other. I take the ground that there is a physical basis for crime, having its seat in the nervous system.

Dr. Fuchs: But not that he is necessarily a criminal because he is built in a certain way?

Dr. Becker: No. I do not think we can determine in advance a criminal simply because of his structure. I think many of the stigmata exist in people who are not criminals. I think from our standpoint we must divide people into the *non-criminal*, that is, those who do not require any special deterrent influences, the *criminal* potentially at least, who may still be deterred by their surroundings, by fear of punishment, or by punishment which is the same thing, and the *defectives*, in whom any amount of punishment never deters. These last come properly into the domain of the physician.

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In Memoriam

Francis H. Bodenius

Born July 21, 1845

Died July 21, 1898

William Deacher

Born May 27, 1833

Died April 22, 1898

Lucius Melander Squire

Born June 11, 1866

Died March 7, 1898

George Densmore Wilber

Born —— 1828

Died December 11, 1897

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OBITUARIES.

Opus Finis Coronat.

FRANCIS H. BODENIUS, M. D., OF MADISON.

BY J. A. MACK, M. D.

Dr. Bodenius was born in Baden, Germany, July 21, 1845, and died on his fifty-third birthday. Being of noble birth he was given an excellent education at the universities of Heidelberg and Paris, from both of which he graduated. He was a surgeon in the German army during the Franco-Prussian war, and after the war ended was surgeon on the North German Lloyd steamers plying between Bremen and New York. In 1872 he settled in Newark, N. J., and practiced there until 1879, when he came to Madison. He served seven years as city health-officer, and instituted many reforms. As a member of the State Board of Health he had nearly served one term of five years, receiving a re-appointment from Gov. Scofield last winter.

Dr. Bodenius was unquestionably a well educated physician. He was outspoken and frank, and had no use for diplomacy either in his profession or in public affairs. Early in the year he complained of a throat trouble which eventually became so annoying he determined to seek surgical relief. For that purpose he went to Baltimore, entered the John Hopkins hospital, was operated on for what proved to be cancer of the tongue; while the operation itself was successful, pneumonia as a complication exhausted his vitality.

WM. MEACHER, M. D., OF PORTAGE.

BY R. W. EARLL, M. D.

The death of Dr. Wm. Meacher, of Portage, which occurred April 22, 1898, removes from the profession one of its most useful and honored members, and from the community

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a good citizen as well. Dr. Meacher was born May 27, 1833, in Bungay, Suffolk county, England. When he was ten years old his parents came to this country and settled in Monroe county, New York; removing in 1844 to Wisconsin. Up to this time his opportunities for an education had been very limited, but now a desire seized him for mental improvement, and he determined to educate himself. Beginning with arithmetic, grammar, and spelling, he spent his forenoons in study, and the afternoons at work on the farm or at carpenter work. He afterwards became a teacher in the public schools. That his home study must have been efficient is shown by the fact that, till 22 years of age, he had attended school less than three years.

In early life it had been his desire to become a physician, but it had always seemed beyond his reach. However, he determined to make the attempt, and, with the encouragement of Dr. O. D. Coleman, of Pardeeville, of whom he borrowed medical books, he began the study of medicine at home, dividing his time between study and work on the farm to support his family. At the end of two years thus spent, he had accumulated sufficient means to take a course of lectures at Rush Medical College, Chicago.

In the following summer he located in Waushara county, but later gave up the plan of practicing there and attended a second term at Rush, graduating from that institution in 1862. He afterward frequently visited the college for post graduate work, and pursued medical studies for one year in London, England. After graduating at Rush he was commissioned as assistant surgeon of the Sixteenth Wisconsin Volunteers, and later served for four months as contract surgeon in the civil war. He was at the siege of Atlanta, and marched to the sea with Sherman.

Dr. Meacher located at Portage in the summer of 1870, at which place he has been in continuous practice till the time of his death. Of late years he had devoted himself largely

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to surgery, in which he achieved marked success, ranking among the foremost surgeons in the State. His practice embraced many dangerous and difficult cases in connection with an extensive consultation practice over a large portion of the State. He has frequently contributed articles on various surgical subjects, which were thoughtful and original. He had been surgeon at Portage for the Mil. & St. Paul R. R. at least twenty years, and for the Wisconsin Central nearly half that length of time. He was, and had long been by appointment, physician for the poor of the city, and had served two terms as health-officer of Portage. His standing as a physician was frequently recognized by the profession of the State. He was a member of the American Medical Association, the State Medical Society, and the Central Wisconsin Medical Society. He was an ex-president of the two latter societies, having been President of the State Society in 1882. He was also a Censor of the Society for many years, and one of the oldest members, having joined the Society in 1869. He was also an ex-president of the Northwestern Medical Society of Wisconsin.

In 1893 Dr. Meacher was elected Superintendent of the Northern Hospital for Insane at Oshkosh, by the State Board of Control, but after consideration declined the honor, to devote his time to his practice. He was the inventor of several surgical appliances now in general use.

Dr. Meacher was a man who read extensively and well on all subjects in which he became interested. He had a logical and well-trained mind with a deep-seated abhorrence of anything partaking of sham or insincerity. He always treated his professional brethren with courtesy and fairness. Dr. Meacher was married in 1854 to Miss Jane E. Clayton. Three daughters and one son survive him. The son, Byron C. Meacher, M. D., is a successful and highly respected physician and surgeon in Portage, Wis., where he was a partner of his father's for many years.

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LUCIUS MELANDER SQUIRE, M. D., OF POYNETTE.

Lucius M. Squire was born in Wisconsin June 11, 1866. He lived with his parents at Leeds Center until his tenth year, at which time they moved to Poynette, Wis. He graduated from the Poynette high school in 1884, and from the Wisconsin State university in 1888. He entered the Chicago Medical college, remaining there two years, and graduating from Rush Medical college in 1891. He commenced the practice of Medicine at Poynette with his father, and continued with him up to the time he was taken sick, one year before he died. The last year was spent in California without any beneficial results. He died March 7, 1898. He was a good student, attentive to business, kind to his parents, a Christian gentleman. He had a genial, sociable disposition, which, combined with his Christian character, made everybody his friend. He had always a kind and cheering word for the unfortunate, and while he ministered to the physical wants, he was sure to leave a lasting impression of his moral character with all with whom he came in contact.

He took an active interest in medical societies. He was a member of the Central Wisconsin Medical Society for several years, and joined the State Medical Society in 1896. He was also a member of the American Medical Association. In these different organizations he was at all times a willing and enthusiastic worker. While modest and retiring in disposition, he had positive opinions which he could clearly and intelligently present. With a mind trained to accurate thought by a thorough preliminary course of study, he was unusually well prepared for the consideration and discussion of medical topics. Moreover, added to natural mental powers of a high order, he had an intense moral earnestness which could not fail to secure growth and progress in his beloved calling. He was honest, sincere, and upright in all his dealings. Very few young physicians had brighter prospects for a happy and

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successful career, and the medical profession has sustained a serious loss in his early death.

Two years after commencing practice he was married to Mary Gault, daughter of W. C. Gault, of Poynette, Wis. He left one child, a son about four years of age.

GEORGE DENSMORE WILBER, M. D., OF MINERAL POINT.

George Densmore Wilber was born in Portland; Chautauqua county, New York, 1828, and went to Elgin, Illinois, in 1843. He graduated in medicine, February, 1847, at the Indiana Medical College, located at Mineral Point, Wisconsin, in 1848, and migrated to Silverton, Colorado, in 1881, on account of ill health. He was Secretary of the Wisconsin State Medical Society from 1850 to the eve of the Rebellion, and is an honorary member of that Society; he became a member of the American Medical Society in 1854. He was surgeon of the Fifth Wis. Inf. Vols. during the war; at the close of which he studied at Bellevue Hospital Medical College, College of Physicians and Surgeons, and the hospitals of New York, taking also special courses in several branches. After spending several years in different climates in pursuit of health, he died in Pasadena, California, December 11, 1897, of pneumonia.

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CONSTITUTION AND BY-LAWS OF THE STATE MEDICAL SOCIETY OF WISCONSIN.

[As amended June, 1889.]

PREAMBLE.

We, the undersigned, Physicians and Surgeons of the State of Wisconsin, in order to cultive harmony and good feeling among the members of the medical profession, to promote the advancement of the medical and collateral sciences, and to assist us in acquiring a knowledge of the same, and in keeping pace with the progress of medical science, to help us appreciate the magnitude and nature of the mutual duties existing between the medical profession and the community, and to protect ourselves and society against the imposition of medical pretenders, do hereby agree to associate ourselves together, and be governed by the following

CONSTITUTION.

ARTICLE I.—This organization shall be known by the name of the State Medical Society of Wisconsin.

ART. II.—The Society shall meet annually, on the First Wednesday of May or June, as may be directed by the Secretary, at 8:00 o'clock P. M., in the place designated by the Society at its previous meeting.

ART. III.—Twenty members of this Society shall constitute a quorum for the transaction of business, but any number may adjourn from time to time.

ART. IV.—The officers of this Society shall consist of a President, First and Second Vice-Presidents, a Secretary, an Assistant Secretary, a Treasurer and three Censors, who shall be elected at the annual meeting, and shall hold their offices respectively for the term of one year, except the Censors, one of whom shall be elected annually to serve for a term of three years. All officers elected by the Society shall hold their respective offices until their successors are duly elected.

ART. V.—The President shall preside at the meetings, preserve order and decorum in debate, give a casting vote when necessary, and perform all the other duties that custom and parliamentary usage may require, and deliver an address at the close of his term of office. He may call *special meetings* at any time, if he deem it necessary; and it shall be his duty to call such meetings whenever requested, in writing, to do so, by five members of this Society.

ART. VI.—In case of the absence or inability of the President to discharge his duties, the latter shall devolve upon the Vice-Presidents, and in the order of their election.

ART. VII.—The Secretary shall record the minutes and authenticate the proceedings, give due notice of all meetings, conduct the correspondence of the

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Society, preserve all records and papers belonging to the Society, shall have authority to employ a competent stenographer to assist him at each annual meeting, and at the close of his term of office shall lay before the Society a full report of his official correspondence and doings.

ART. VIII.—The Treasurer shall collect and receive all moneys due or presented to the Society, and shall disburse the same under its direction. He shall keep a book in which he shall enter the debits and credits of every member, the amounts received and distributed by him as Treasurer, and shall, at the expiration of his term of office, and at any other time, when requested to do so by the Society, report the condition of the Treasury.

ART. IX.—The Censors shall constitute a committee for the examination of applicants for membership, but shall entertain no application for membership unless the applicant shall present the certificate of two members of this Society as to his moral and professional character.

ART. X.—Any regular physician making application for membership in accordance with the provisions of ART. IX, and who shall present a diploma from a regular school of medicine of good repute, or certificate or diploma of membership in a county or district medical society, accompanied by a certificate of six years' practice, or who shall submit to such an examination as the Censors may impose, shall, on their recommendation and on receiving a vote of two-thirds of the members present at any annual meeting, be entitled to membership by signing the constitution and paying five ($5.00) dollars to the Treasurer of the Society, which sum shall include his annual dues for one year.

ART. XI.—This Society may elect honorary members at any annual meeting, by a vote of three-fourths of the members present.

ART. XII.—All regularly organized County medical societies in the State may elect delegates to this Society in the ratio of one for every ten of its members, and such delegates shall, on payment of the annual dues, be entitled to all the privileges of membership in this Society during the time for which they are elected.

ART. XIII.—This Society shall have the power to obtain funds by an equal assessment of its members, by voluntary contributions, and by the sale and disposal of publications and of works of publication; but no assessment shall be made for more than three dollars upon each member in any one year, nor except at annual meetings, or at meetings called for that express purpose; in the latter case the object of the meeting shall be set forth and published in the call.

ART. XIV.—This Society may censure, reprimand, or expel any member for improper conduct, as may be prescribed by the By-Laws.

ART. XV.—No amendment shall be made to this Constitution, unless such proposed amendment shall have been submitted in writing at some previous regular meeting of the Society, and for such action thirty members shall be necessary for a quorum, and two-thirds of the members present shall vote for the amendment; *Provided*, however, that by a unanimous vote of thirty or more members present, at any annual meeting, any article of this Constitution may

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be amended or repealed, and articles added thereto without such previous notice.

ART. XVI.—That the section on legal medicine be so organized in the Wisconsin State Medical Society as to admit attorneys to the meetings of said section, and to membership in the same, on the same terms and in the same manner as members are admitted to membership in said Society. That all members of said Society be members of said section without extra fee. That all attorneys becoming members of said section shall pay to the Treasurer of said Society one and one-half dollars ($1.50), and the same amount annual dues, which shall entitle them to all benefits of said section, including publications of proceedings of said section.

BY-LAWS.

RULES OF ORDER.

ARTICLE I.—In the discussion and disposition of all business coming before the State Medical Society of Wisconsin, parliamentary rules of debate shall be observed, and Robert's manual shall be the guide.

ORDER OF BUSINESS.

ART. II.—The order of business at each annual meeting of the Society shall be arranged by an executive committee, composed of the President, the Secretary and the Committee on Arrangements, and shall ordinarily embrace the following:

WEDNESDAY, 11:00 O'CLOCK A. M.

1. Calling of meeting to order by the President.
2. Opening of the session by prayer.
3. Report of Committee on Arrangements.
4. Addresses of welcome or other impromptu addresses.

FORCE OF THE CODE OF ETHICS.

ART. III.—The Code of Ethics heretofore adopted by this Society from the American Medical Association shall have the full force of any article of either the Constitution or the By-Laws.

DISCIPLINE OF MEMBERS.

ART. IV.—SECTION 1.—Any member shall be liable to censure, suspension, or expulsion for willful neglect of the rules and regulations of this Society, for any flagrant violation of our Code of Ethics or for any gross or immoral conduct.

A vote of two-thirds of the members present shall be requisite to censure, to suspend or to expel.

SEC. 2.—All charges against a member which might lead to his censure, suspension, or expulsion shall first be made to the Committee on Ethics, which Committeee shall take cognizance of and investigate any information or evi-

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dence presented to it, of unprofessional conduct on the part of any member. In case said Committee shall find such charges or information sufficiently sustained to warrant further investigation, written notice of such charges or information shall be given such member by the Secretary of said Committee and such member afforded an opportunity for a hearing before said Committee. In case the said Committee find such charges or information sustained it shall make such report to the Society in executive session.

SEC. 3.—Any member of this Society who, from professional incompetency, or for any other sufficient reason not already mentioned, shall be deemed unworthy of the fellowship of the Society, may be deprived of his membership, as provided in sections one (1) and two (2) of this article.

SEC. 4.—Any member of this Society who shall absent himself from the meetings of the same for three consecutive years without rendering the Society a satisfactory excuse shall lose membership in the same.

SEC. 5.—Any member failing for a period of three years to pay to the Society the sum of three dollars, annual dues, shall also lose membership in the Society.

SEC. 6.—Any member who has lost membership in the Society, under Sections 4 and 5 of Article IV of the By-Laws, may be re-instated upon the recommendation of the Censors, by receiving a vote of two-thirds of the members present at any meeting, and be entitled to membership by again signing the Constitution and paying five ($5.00) dollars to the Treasurer, which sum shall include his annual dues for one year.

STANDING COMMITTEES.

ART. V.—The Secretary, President, and Treasurer shall be *ex officio*, a Committee on Publication, who shall have charge of all matters intended for the press and superintend their publication, but the Society shall not be understood as indorsing any paper published unless it does so by special resolution.

For preparing, arranging, and expediting business for each next ensuing year and for carrying out the objects of the Society the President-elect at each annual meeting shall appoint:

SECTION 1.—A Committtee of Arrangements consisting of three members, who shall provide suitable accommodations for the meetings of the Society, and in general have charge of the interests of the Society while in session.

SEC. 2.—A Committee of Finance, consisting of three members, who shall audit the Treasurer's report and such other accounts as may be referred to them, and recommend suitable action thereon.

SEC. 3.—[1] A Committee on Practical Medicine, Surgery, Obstetrics and Gynecology, Materia Medica, Ophthalmology and Otology, Nervous Diseases,

[1] The following resolution was adopted June, 1890 (see page 47, Transactions, 1890):
"*Resolved*, That when the President appoints the Standing Committees he shall designate a Chairman and Secretary to each Committee, who shall have charge of their respective departments and be expected to see that papers, discussions, exhibitions, etc., on subjects in their sections are furnished for the next succeeding annual meeting."

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Laryngology, Hygiene, and such other Special Committees as will, in the judgment of the President, best advance the interests of the Society. The duties of these Committees shall be to report any recent advancement or discuss some subject pertaining to that department.

SEC. 4.—The President shall also annually nominate three members of the Committee on Ethics, each to serve for three years (subject to confirmation or rejection by vote of the Society), so that this Committee shall consist of nine members. This Committee shall consider all cases for discipline of members. All charges made shall be referred to them without discussion; all evidence shall be presented to them and they shall report their conclusions to the Society.

THE SECRETARY.

ART. VI.—The Secretary shall receive an annual salary of one hundred dollars, and his annual dues shall be remitted. The Assistant Secretary, if a resident of the place where the session of the Society is to be held, shall be *ex officio* a member of the Committee on Arrangements.

AMENDMENTS.

ART. VII.—SECTION 1.—That at the annual meeting a dinner shall be provided at the expense of the Society, under the direction of an Anniversary Chairman, and a Committee appointed for that purpose.

SEC. 2.—An invitation to the dinner may be given to such strangers, professional or otherwise, as the President of the Society or Anniversary Chairman shall think proper to notice in this manner.

SEC. 3.—That a roll of honor, consisting of all deceased members of the Society, shall be called by the Anniversary Chairman at every annual banquet, immediately after the opening prayer, all the members standing.

ART. VIII.—These By-Laws may be altered, added to, or repealed by a three-fourths vote at any annual meeting.

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OFFICERS OF THE SOCIETY FROM 1847 TO THE PRESENT TIME.

Year.	*President.*	*Vice-Presidents.*	*Secretary.*	*Treasurer.*
1847	Mason C. Darling		C. B. Chapman (rec)	
1848	J. B. Dousman	L. B. Brainard	C. B. Chapman (rec) Jesse Moore (cor)	B. B. Carey.
1849	J. B. Dousman	L. B. Brainard	C. B. Chapman (rec) Jesse Moore (cor)	
1850	A. L. Castleman	E. G. Dyer	G. Wright (rec) J. P. Whitney (cor)	B. B. Carey.
1851	A. L. Castleman	Harmon Van Dusen	Geo. D. Wilber (rec) J. P. Whitney (cor)	B. B. Carey.
1852	Harmon Van Dusen	John Mitchell	A. J. Ward (rec) Geo. D. Wilber (cor)	J. B. Dousman.
1853	Harmon Van Dusen	John Mitchell	A. J. Ward (rec) Geo. D. Wilber (cor)	Jos. Gray.
	No quorum. Adjourned to meet in Madison, 1854.			
1854	Harmon Van Dusen	John Mitchell	A. J. Ward (rec) Geo. D. Wilber (cor)	Jos. Gray.
	At this meeting, amendment to Constitution to admit unlimited members was urged; passed same day.			
1855	A. L. Castleman	D. Cooper Ayres, 1st Azel P. Ladd, 2d	Geo. D. Wilber	Jos. Gray.
1856	John Mitchell	Jno. B. Dousman, 1st Solomon Blood, 2d	Geo. D. Wilber	Jos. Gray.
1857	D. Cooper Ayres	Wm. H. Brisbane, 1st Clark G. Pease, 2d	Geo. D. Wilber	Jos. Gray.
1858	Clark G. Pease	Solomon Blood, 1st Hays McKinley, 2d	Geo. D. Wilber	A. J. Ward.
1859	Clark G. Pease	Solomon Blood, 1st Hays McKinley, 2d	Geo. D. Wilber	A. J. Ward.
1860	E. L. Carr	B. O. Reynolds, 1st C. J. Taggart, 2d	C. G. Pease	C. G. Pease.
1861	E. L. Carr	B. O. Reynolds, 1st H. A. Youmans, 2d	C. G. Pease	C. G. Pease.

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OFFICERS OF THE SOCIETY FROM 1847 TO THE PRESENT TIME.—Continued.

Year.	*President.*	*Vice-Presidents.*	*Secretary.*	*Treasurer.*
1862	Solomon Blood	H. A. Youmans, 1st S. S. Clark, 2d	C. G. Pease	C. G. Pease.
1863–1866	War of the Rebellion.	No meetings held.		
1867	Harmon Van Dusen	J. B. Whiting, 1st Darius Mason, 2d	H. P. Strong	H. P. Strong.
1868	Harmon Van Dusen	J. B. Whiting, 1st Darius Mason, 2d	H. P. Strong	H. P. Strong.
1869	Harmon Van Dusen	J. B. Whiting, 1st Darius Mason, 2d	H. P. Strong	H. P. Strong.
1870	Solon Marks	N. Dalton, 1st Jno. Favill, 2d	H. P. Strong	H. P. Strong.
1871	H. P. Strong	Darius Mason, 1st A. H. Van Orstrand, 2d	Jas. T. Reeve	Jas. T. Reeve.
1872	Jno. Favill	M. Waterhouse, 1st J. K. Bartlett, 2d	Jas. T. Reeve	Jas. T. Reeve.
1873	Harmon Van Dusen	E. L. Griffin, 1st Jno. Dickson, 2d	Jas. T. Reeve	Jas. T. Reeve.
1874	M. Waterhouse	T. P. Russell, 1st S. A. Ferrin, 2d	Jas. T. Reeve Theron Nichols (asst)	Jas. T. Reeve.
1875	J. T. Reeve	E. W. Bartlett, 1st L. G. Armstrong, 2d	Theron Nichols Wm. Fox (asst)	Theron Nichols.
1876	J. B. Whiting	Ira Manley, Jr., 1st N. Senn, 2d	Jas. T. Reeve Theron Nichols (asst)	Jas. T. Reeve.
1877	J. K. Bartlett	T. P. Russell, 1st James Cody, 2d	Jas. T. Reeve	Jas. T. Reeve.
1878	Darius Mason	W. Kempster, 1st C. L. Stoddard, 2d	Jas. T. Reeve	Jas. T. Reeve.
1879	Nicholas Senn.	H. L. Butterfield, 1st J. G. Meacham, Sr., 2d	Jas. T. Reeve	Jas. T. Reeve.
1880	J. G. Meachem, Sr.	S. L. Marston, 1st E. W. Bartlett, 2d.	Jas. T. Reeve	Jas. T. Reeve.

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OFFICERS OF THE SOCIETY FROM 1847 TO THE PRESENT TIME.—Continued.

Year.	*President.*	*Vice-Presidents.*	*Secretary.*	*Treasurer.*
1881	Ira Manley, Jr.	B. O. Reynolds, 1st L. S. Marston, 2d	Jas. T. Reeve	Jas. T. Reeve.
1882	Wm. Meacher	F. H. Day, 1st C. Linde, 2d	Jas. T. Reeve	Jas. T. Reeve.
1883	T. P. Russell	J. H. Vivian, 1st Darius Mason, 2d	Jas. T. Reeve	Jas. T. Reeve.
1884	N. M. Dodson	E. W. Bartlett, 1st G. W. Jenkins, 2d	Jas. T. Reeve	Jas. T. Reeve.
1885	E. W. Bartlett	L. S. Marston, 1st G. M. Steele, 2d	Jas. T. Reeve	Jas. T. Reeve.
1886	G. M. Steele	S. C. Johnson, 1st D. C. Davies, 2d	Jas. T. Reeve	Jas. T. Reeve.
1887	S. C. Johnson	L. G. Armstrong, 1st C. Ottilie, 2d	Jas. T. Reeve	Jas. T. Reeve.
1888	L. G. Armstrong	Christian Linde, 1st R. M. Wigginton, 2d	Jas. T. Reeve	Jas. T. Reeve.
1889	J. R. Barnett	G. D. Ladd, 1st H. Francis Sercombe, 2d	Jas. T. Reeve J. R. McDill (asst)	Jas. T. Reeve.
1890	E. M. Rogers	W. T. Sarles, 1st Wm. Mackie, 2d	J. R. McDill F. E. Walbridge (asst)	Sidney S. Hall.
1891	G. D. Ladd	F. E. Walbridge, 1st B. T. Phillips, 2d	J. R. McDill H. V. Ogden (asst)	Sidney S. Hall.
1892	Geo. F. Witter	Jno. Binnie, 1st J. A. Bach, 2d	C. S. Sheldon H. P. Wenzel (asst)	Sidney S. Hall.
1893	B. T. Phillips	S. W. French, 1st D. J. Hayes, 2d	C. S. Sheldon H. P. Wenzel (asst)	Sidney S. Hall.
1894	B. C. Brett	H. M. Brown, 1st Hugo Philler, 2d	C. S. Sheldon H. P. Wenzel (asst)	Sidney S. Hall.
1895	Almon Clarke	J. A. Ballard, 1st U. O. B. Wingate, 2d	C. S. Sheldon C. M. Gould (asst)	Sidney S. Hall.
1896	F. W. Epley	J. F. Pritchard, 1st F. Shimonek, 2d	C. S. Sheldon L. S. Brown (asst)	Sidney S. Hall.

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OFFICERS OF THE SOCIETY FROM 1847 TO THE PRESENT TIME.—Continued.

Year.	*President.*	*Vice-Presidents.*	*Secretary.*	*Treasurer.*
1897	B. O. Reynolds	William Mackie, 1st Margaret Caldwell, 2d	C. S. Sheldon Francis A. Brodsky (asst)	Sidney S. Hall.
1898	William Mackie	F. R. Garlock, 1st G. E. Seaman, 2d	C. S. Sheldon Arthur T. Holbrook (asst)	Sidney S. Hall.
1899	H. Reineking	John Phillips, 1st Chas. W. Oviatt, 2d	C. S. Sheldon George M. Steele (asst)	Sidney S. Hall.

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MEMBERSHIP OF THE STATE MEDICAL SOCIETY OF WISCONSIN.

Year of Election.	Name.	Residence.	County.
1894	Abaly, W. C.	Madison,	Dane.
1894	Adamson, Frederick W.	Ridgeway,	Iowa.
1892	Allen, Stanton	Milwaukee,	Milwaukee.
1886	Amundson, A. C.	Cambridge,	Dane.
1895	Anderson, A.	Minneapolis, Minn.	
1891	Anderson, Harriett A.	Pine Bluff,	Dane.
1892	Armstrong, Charles A.	Boscobel,	Grant.
1868	Armstrong, L. G.	Boscobel,	Grant.
1885	Atwell, W. F.	Stevens Point,	Portage.
1889	Bach, J. A.	Milwaukee,	Milwaukee.
1893	Bachhuber, Louis M.	Mayville,	Dodge.
1886	Bacon, J. E.	Waukesha,	Waukesha.
1898	Bading, Gerhardt A.	Milwaukee,	Milwaukee.
1895	Baird, John	West Superior,	Douglas.
1881	Ballard, J. A.	La Crosse,	La Crosse.
1889	Barnes, E. C.	Ripon,	Fond du Lac.
1870	Barnes, H. L.	Ripon,	Fond du Lac.
1892	Barnes, J. Steele	Milwaukee,	Milwaukee.
1873	Barnett, J. R.	Neenah,	Winnebago.
1870	Bartlett, E. W.	Milwaukee,	Milwaukee.
1888	Batchelor, W. A.	Milwaukee,	Milwaukee.
1892	Beebe, C. A.	Marshall,	Dane.
1897	Beebe, Carl M.	Sparta,	Monroe.
1886	Beebe, D. C.	Sparta,	Monroe.
1898	Bechmann, Chas. R.	La Crosse,	La Crosse.
1894	Becker, William Francis	Milwaukee,	Milwaukee.
1898	Becker, Wilhelm	Milwaukee,	Milwaukee.
1869	Bell, Samuel	Beloit,	Rock.
1892	Bennett, Edwin G.	Brodhead,	Green.
1896	Bennett, Lewis F.	Beloit,	Rock.
1894	Bennett, William C.	Milwaukee,	Milwaukee.
1894	Beutler, William F.	Wauwatosa,	Milwaukee.
1885	Bill, B. J.	Genoa Junction,	Walworth.
1897	Billmeyer, D. Harrison	Waupun,	Fond du Lac.
1870	Binnie, John	Poynette,	Columbia.
1896	Bird, Maurice D.	Marinette,	Marinette.
1896	Bird, Rosellette	Beaver Dam,	Dodge.

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Year of Election.	Name.	Residence.	County.
1878	Bird, H. R.	Arena,	Iowa.
1896	Bishop, Thomas W.	Platteville,	Grant.
1897	Blocki, A. F.	Sheboygan,	Sheboygan.
1897	Bock, Otto B.	Sheboygan,	Sheboygan.
1898	Bodenstab, Wm. H.	Milwaukee,	Milwaukee.
1888	Boorse, Lorenzo,	Milwaukee,	Milwaukee.
1898	Boerner, Reinhardt W.	Milwaukee,	Milwaukee.
1856	Borden, Wm. H.	Milton,	Rock.
1896	Bradfield, J. A. L.	La Crosse,	La Crosse.
1896	Breakey, Jas. R.	Alma Center,	Jackson.
1897	Breckenridge, H. E.	Racine,	Racine.
1867	Brett, Ben C.	Green Bay,	Brown.
1896	Brett, Fred N.	Green Bay,	Brown.
1889	Brodsky, Francis A.	Racine,	Racine.
1888	Bromley, F. W.,	Palmyra,	Jefferson.
1877	Broughton, R.	Dwight, Ill.	
1895	Brown, Belno A.	Milwaukee,	Milwaukee.
1898	Brown, Geo. V. I.	Milwaukee,	Milwaukee.
1889	Brown, Horace M.	Milwaukee,	Milwaukee.
1892	Brown, Isaac M.	New London,	Waupaca.
1888	Brown, L. S.	Madison,	Dane.
1896	Brown, Robt. W.	Glenwood,	St. Croix.
1898	Brown, Robt. Curtis	Milwaukee,	Milwaukee.
1897	Brück, C. A. A.	Milwaukee,	Milwaukee.
1886	Buck, Erastus J.	Platteville,	Grant.
1883	Buckmaster, S. B.	Lake Geneva,	Walworth.
1897	Buchan, Samuel C.	Racine,	Racine.
1898	Buland, Geo. L.	Greenwood,	Clark.
1887	Burgess, A. J.	Milwaukee,	Milwaukee.
1898	Byers, Frederick W.	Monroe,	Green.
1890	Cairncross, J. W.	Wauwatosa,	Milwaukee.
1885	Caldwell, Margaret,	Waukesha,	Waukesha.
1888	Campbell, Bernard L.	Monches,	Waukesha.
1894	Canright, Orlo S.	East Troy,	Walworth.
1890	Carpenter, W. T.	Iron Mountain, Mich.	
1874	Catlin, Geo. E.	Lake Geneva,	Walworth.
1887	Cavaney, J.	Milwaukee,	Milwaukee.
1896	Chandler, Ada B.	Pardeeville,	Columbia.
1896	Chandler, Joseph	Pardeeville.	Columbia.
1890	Chandler, Ralph	Milwaukee,	Milwaukee.
1897	Chapman, Francis M.	Sussex,	Waukesha.
1895	Christensen, A.	Washburn,	Bayfield.
1898	Christensen, Christian	La Crosse,	La Crosse.
1898	Christensen, E. S.	Two Rivers,	Manitowoc.

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Year of Election.	Name.	Residence.	County.
1894	Chrysler, Oscar	National Soldiers' Home,	Milwaukee.
1872	Clarke, Almon	National Soldiers' Home,	Milwaukee.
1890	Clark, Miles H.	Milwaukee,	Milwaukee.
1886	Clason, J. A.	Neosho,	Dodge.
1898	Coakley, Walter Byron	Milwaukee,	Milwaukee.
1881	Coates, John T.	Milwaukee,	Milwaukee.
1898	Coffey, Chas. James	Milwaukee,	Milwaukee.
1897	Cohn, Arthur H.	Milwaukee,	Milwaukee.
1895	Collier, Lewis B.	Merrill,	Lincoln.
1891	Collins, D. B.	Madison,	Dane.
1893	Comfort, Aaron I.	National Soldiers' Home,	Milwaukee.
1898	Confer, Francis M.	Monroe,	Green.
1895	Conkey, Chas. DeWitt	West Superior,	Douglas.
1898	Conley, John Mayo	Oshkosh,	Winnebago.
1896	Connell, James P.	Fond du Lac,	Fond du Lac.
1893	Connell, M. E.	Wauwatosa,	Milwaukee.
1867	Coolidge, S. C.	Middleton,	Dane.
1884	Coon, J. W.	Milwaukee,	Milwaukee.
1888	Copeland, Ernest	Milwaukee,	Milwaukee.
1894	Corbett, J. Fremont	Weyauwega,	Waupaca.
1892	Corbett, M. E.	Oshkosh,	Winnebago.
1897	Cossitt, Willet S.	S. Milwaukee,	Milwaukee.
1891	Crosse, Theo. P.	Sun Prairie,	Dane.
1896	Cunningham, M. A.	Janesville,	Rock.
1890	Currens, J. R.	Two Rivers,	Manitowoc.
1892	Cutter, John D.	Tomahawk,	Lincoln.
1868	Davies, D. C.	Columbus,	Columbia.
1887	Dawley, Geo. T.	New London,	Waupaca.
1891	Day, D. W.	Eau Claire,	Eau Claire.
1886	Day, H. L.	Eau Claire,	Eau Claire.
1897	Daniels, Alfred D.	Rhinelander,	Oneida.
1897	Darby, Henry C.	Wilmot,	Kenosha.
1887	Darling, R. H.	Milwaukee,	Milwaukee.
1892	Deahofe, S. P.	Mineral Point,	Iowa.
1893	De Chesne, Léon	Sawyer,	Door.
1890	De Lap, R. H.	Richland Center,	Richland.
1894	Dodge, N.	Milwaukee,	Milwaukee.
1873	Dodson, B. F.	Berlin,	Green Lake.
1883	Dodson, J. M.	Chicago, Ill.	
1871	Dodson, N. M.	Berlin,	Green Lake.
1898	Doege, Karl W.	Marshfield,	Wood.
1892	Doyle, James F.	Green Bay,	Brown.
1898	Dougherty, Albert A.	Boaz,	Richland.
1894	Dougherty, Clement F.	Muscoda,	Grant.

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Year of Election.	Name.	Residence.	County.
1893	Durr, William E.	Milwaukee,	Milwaukee.
1888	Earles, W. H.	Milwaukee,	Milwaukee.
1879	Earll, R. W.	Columbus,	Columbia.
1872	Eastman, Wm.	Mineral Point,	Iowa.
1898	Edsall, Frank H.	Madison,	Dane.
1894	Edwards, Adelbert	Reedsburg,	Sauk.
1897	Edwards, John B.	Mauston,	Juneau.
1897	Elliot, M. Agnes	Racine,	Racine.
1893	Ellis, W. E.	Prentice,	Price.
1895	Ellis, Wm. H.	Barron,	Barron.
1897	Elmergreen, Ralph	Milwaukee,	Milwaukee.
1890	English, John E.	Baraboo,	Sauk.
1891	Engsberg, Wm. A.	Lake Mills,	Jefferson.
1883	Epley, F. W.	New Richmond,	St. Croix.
1898	Evans, Edward E.	La Crosse,	La Crosse.
1887	Evans, John M.	Evansville,	Rock.
1894	Everhard, Frank Aaron	Ripon,	Fond du Lac.
1892	Falge, Louis	Reedsville,	Manitowoc.
1883	Farnham, A. B.	Milwaukee,	Milwaukee.
1898	Farr, Lyman R.	Beloit,	Rock.
1896	Feld, Carl R.	Watertown,	Jefferson.
1895	Fenelon, Chas. D.	Phillips,	Price.
1894	Fish, Edmund F.	Milwaukee,	Milwaukee.
1870	Fisk, M. H.	Wauwatosa,	Milwaukee.
1893	Fitzgibbon, Thomas	Milwaukee,	Milwaukee.
1897	Flett, Charles	Waterford,	Racine.
1892	Flower, Dwight	Monticello,	Green.
1890	Ford, J. Frank	Omro,	Winnebago.
1891	Fortier, C. A.	Florence,	Florence.
1867	Fox, Philip	Madison,	Dane.
1891	Fox, P. R.	Madison,	Dane.
1881	Frank, Louis F.	Milwaukee,	Milwaukee.
1894	Fraser, Alexander Campbell	Manitowoc,	Manitowoc.
1896	Frederick, H. H. F.	Friendship,	Adams.
1883	French, S. W.	Milwaukee,	Milwaukee.
1896	French, Viola M.	La Crosse,	La Crosse.
1894	Friend, Samuel Henry	Milwaukee,	Milwaukee.
1896	Fuchs, Albert F.	Loyal,	Clark.
1893	Fuller, Hezekiah D.	Seymour,	Outagamie.
1875	Gage, M. R.	Sparta,	Monroe.
1884	Garlock, F. R.	Racine,	Racine.
1895	Gasser, Herman	Platteville,	Grant.
1897	Genter, Arthur E.	Sheboygan,	Sheboygan.
1898	Gibson, James	Janesville,	Rock.

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Year of Election.	Name.	Residence.	County.
1898	Gilbert, Herman	Hartford,	Washington.
1896	Gillen, Frederick C.	Milwaukee,	Milwaukee.
1887	Godfrey, Jos.	Lancaster,	Grant.
1896	Goetsch, Alice J.	Watertown,	Jefferson.
1896	Golden, Chas. H.	Wonewoc,	Juneau.
1896	Gordon, Frank H.	Lake Mills,	Jefferson.
1890	Gordon, W. A.	Northern Hospital,	Winnebago.
1890	Gorst, Chas.	Baraboo,	Sauk.
1886	Gould, C. M.	West Superior,	Douglas.
1874	Graettinger, Alois	Milwaukee,	Milwaukee.
1898	Graham, Chas. W.	Milwaukee,	Milwaukee.
1898	Gratiot, C. C.	Shullsburg,	La Fayette.
1897	Green, Albert	Rockford, Ill.	
1886	Gregory, L. M.	Stevens Point,	Portage.
1883	Grider, A. B.	Milwaukee,	Milwaukee.
1898	Grosskopf, Ernest C.	Wauwatosa,	Milwaukee.
1895	Ground, Wm. E.	West Superior,	Douglas.
1885	Gudden, B. C.	Oshkosh,	Winnebago.
1897	Gudex, Valentine A.	Milwaukee,	Milwaukee.
1898	Gundersen, Adolf	La Crosse,	La Crosse.
1897	Gunther, Wm. H.	Sheboygan,	Sheboygan.
1896	Gutsch, Otto J.	Sheboygan,	Sheboygan.
1898	Gygax, Paul	Milwaukee,	Milwaukee.
1877	Hall, Samuel	Faulkton, So. Dakota.	
1898	Hall, J. Storrs	Ripon,	Fond du Lac.
1872	Hall, Sidney S.	Ripon,	Fond du Lac.
1886	Hallock, W. E.	Juneau,	Dodge.
1897	Hanson, Wm. C.	Beaver Dam,	Dodge.
1895	Hannum, Henry	Bayfield,	Bayfield.
1896	Harkness, Grove	Waukesha,	Waukesha.
1893	Harnbogen, A. W.	Port Washington,	Ozaukee.
1896	Harper, Cornelius A.	Madison,	Dane.
1893	Harris, Benj. F.	Antigo,	Langlade.
1886	Harrison, Geo. W.	Ashland,	Ashland.
1884	Hartford, W. P.	Cassville,	Grant.
1890	Hathaway, D. Gilbert	Wauwatosa,	Milwaukee.
1897	Haven, Walter S.	Racine,	Racine.
1874	Hausmann, Wm.	Kewaskum,	Washington.
1889	Hay, Thos. H.	Milwaukee,	Milwaukee.
1887	Hayes, C. A.	Chippewa Falls,	Chippewa.
1889	Hayes, D. J.	Milwaukee,	Milwaukee.
1887	Hayes, E. S.	Eau Claire,	Eau Claire.
1886	Hayman, L. H.	Boscobel,	Grant.
1886	Head, L. R.	Madison,	Dane.

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Year of Election.	Name.	Residence.	County.
1893	Heidner, Gustav A.	West Bend,	Washington.
1892	Heising, Albert F.	Menomonie,	Dunn.
1896	Helm, Ernest C.	Beloit,	Rock.
1896	Hess, Calvin F.	Reeseville,	Dodge.
1881	Hewitt, M. R.	Milwaukee,	Milwaukee.
1892	Hidershide, Geo. N.	Arcadia,	Trempealeau.
1893	Hill, Warren B.	Milwaukee,	Milwaukee.
1896	Hipke, William	Hustisford,	Dodge.
1896	Hirth, G. J.	Milwaukee,	Milwaukee.
1893	Hitz, Henry B.	Milwaukee,	Milwaukee.
1887	Hodgson, A. J.	Waukesha,	Waukesha.
1898	Hoffman, Norman	Milwaukee,	Milwaukee.
1897	Holbrook, Arthur T.	Milwaukee,	Milwaukee.
1891	Hosmer, A. J.	Salt Lake City, Utah.	
1887	Hosmer, M. S.	Ashland,	Ashland.
1891	Hougen, O. T.	Grand Rapids,	Wood.
1890	Howard, Albion Z.	Dartford,	Green Lake.
1891	Howard, J. J.	Columbus,	Columbia.
1887	Hoyer, G. C.	Milwaukee,	Milwaukee.
1898	Hooper, Edgar Steven	Darlington,	La Fayette.
1893	Huennekens, J. H.	Milwaukee,	Milwaukee.
1891	Hulburt, F. D.	Reedsburg,	Sauk.
1884	Hurd, H. H.	Chippewa Falls,	Chippewa.
1896	Irwin, George H,	Lodi,	Columbia.
1895	Irwin, Harris J.	Baraboo,	Sauk.
1886	Jackson, J. A.	Madison,	Dane.
1870	Jenkins, G. W.	Kilbourn,	Columbia.
1894	Jenny, Francis L. B.	Milwaukee,	Milwaukee.
1897	Jermain, Louis F.	Milwaukee,	Milwaukee.
1890	Jobse, William	Milwaukee,	Milwaukee.
1880	Johnson, S. C.	Hudson,	St. Croix.
1890	Jones, David T.	Wausau,	Marathon.
1893	Jones, Stella B.	Oshkosh,	Winnebago.
1893	Jones, Thomas R.	Oshkosh,	Winnebago.
1889	Jurgens, L. W.	Fredonia,	Ozaukee.
1893	Kahn, Joseph	Milwaukee,	Milwaukee.
1898	Karsten, Adrian C.	Horicon,	Dodge.
1894	Kaumheimer, G. J.	Milwaukee,	Milwaukee.
1897	Keech, J. Sothoron	Racine,	Racine.
1898	Keithley, John W.	Orfordville,	Rock.
1886	Keller, Sebastian	West Bend,	Washington.
1892	Kelley, Edward J.	Milwaukee,	Milwaukee.
1892	Kelley, Julia P.	Milwaukee,	Milwaukee.
1893	Kellogg, E. Wells	Milwaukee,	Milwaukee.

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Year of Election.	Name.	Residence.	County.
1893	Kelley, Walter J.	Milwaukee,	Milwaukee.
1898	Kemper, William G.	Manitowoc,	Manitowoc.
1894	Kempster, Walter	Milwaukee,	Milwaukee.
1890	Kester, J. W.	Black Earth,	Dane.
1889	King, C. F.	Hudson,	St. Croix.
1886	King, Oscar A.	Lake Geneva,	Walworth.
1898	Kletzsch, Gustav Adolph	Milwaukee,	Milwaukee.
1895	Knapp, L. L.	New Richmond,	St. Croix.
1892	Kordenat, Carl	Reedsburg,	Sauk.
1898	Kovats, Edmund	Milwaukee,	Milwaukee.
1896	Kratzsch, A. W.	Cascade,	Sheboygan.
1894	Kratzsch, Richard	Milwaukee,	Milwaukee.
1870	La Count, D.	Wausau,	Marathon.
1898	Ladoff, Anna Menkin	Milwaukee,	Milwaukee.
1878	Ladd, G. D.	Milwaukee,	Milwaukee.
1883	Langland, P.	Milwaukee,	Milwaukee.
1898	Law, Allan Robert,	Madison,	Dane.
1897	Leffingwell, Hiram S.	Milwaukee,	Milwaukee.
1892	Lemon, Chas. H.	Milwaukee,	Milwaukee.
1896	Le Sage, Eugene	Medford,	Taylor.
1885	Levings, A. H.	Milwaukee,	Milwaukee.
1886	Lewis, L. V.	Sun Prairie,	Dane.
1871	Lindsay, H. E.	Whitewater,	Walworth.
1898	Lockwood, G. S.	Rome,	Jefferson.
1874	Loomis, E. E.	Janesville,	Rock.
1890	Loope, Geo. E.	Bessemer, Mich.	
1889	Luce, J. E.	Chilton,	Calumet.
1898	Luchsinger, Sam'l Chas.	Milwaukee,	Milwaukee.
1897	Lueck, Geo. W.	Fox Lake,	Dodge.
1896	Lyman, Francis A.	Madison,	Dane.
1889	Lyman, J. V. R.	Eau Claire,	Eau Claire.
1897	Lyman, Wm. B.	Mendota,	Dane.
1896	Lynch, Daniel W.	West Bend,	Washington.
1898	Lynch, John W.	Milwaukee,	Milwaukee.
1896	Lyons, James A.	Bear Creek,	Outagamie,
1878	Mack, J. A.	Madison,	Dane.
1885	Mackie, W.	Milwaukee,	Milwaukee.
1896	MacLachlan, W. G.	McFarland,	Dane.
1898	MacGregor, Sam'l A.	Nekoosa,	Wood.
1897	Madden, John	Milwaukee,	Milwaukee.
1895	Maercklein, B. G.	Milwaukee,	Milwaukee.
1883	Mailer, A. C.	De Pere,	Brown.
1894	Malone, Thomas C.	Milwaukee,	Milwaukee.
1893	Malone, W. F.	Milwaukee,	Milwaukee.

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Year of Election.	Name.	Residence.	County.
1867	Marks, Solon	Milwaukee,	Milwaukee.
1886	Marquardt, C. H.	La Crosse,	La Crosse.
1898	Martin, M. T.	Merrimac,	Sauk.
1886	Martin, O. H.	Kewaunee,	Kewaunee.
1875	Masterson, J. A.	Watertown,	Jefferson.
1895	Maurer, A. A.	La Crosse,	La Crosse.
1892	Maxson, Albert S.	Milton Junction,	Rock.
1884	McArthur, D. S.	La Crosse,	La Crosse.
1881	McBride, J. H.	Wauwatosa,	Milwaukee.
1896	McCallister, George H.	Avoca,	Iowa.
1894	McComb, Isaac N.	Brillion,	Calumet.
1887	McDill, J. R.	Milwaukee,	Milwaukee.
1895	McGill, Patrick G.	West Superior,	Douglas.
1895	McGilvra, S. C.	West Superior,	Douglas.
1894	McGovern, John J.	Milwaukee,	Milwaukee.
1897	McGovern, Patrick H.	Cedarburg,	Ozaukee.
1884	McGovern, W. P.	Cedarburg,	Ozaukee.
1896	McKee, Frank W.	Richland Center,	Richland.
1883	McLeod, John A.	Ironwood, Mich.	
1898	McNary, Wm. Duncan	Milwaukee,	Milwaukee.
1878	McNeel, J. Henry	Fond du Lac,	Fond du Lac.
1895	McQuillan, James	West Superior,	Douglas.
1898	McShane, B. E.	Hale's Corner,	Milwaukee.
1895	McWain, H. A.	Poysippi,	Waushara.
1875	Meachem, J. G.	Racine,	Racine.
1896	Meacher, Byron C.	Portage,	Columbia.
1893	Mead, S. W.	Plymouth,	Sheboygan.
1893	Mears, G. V.	Fond du Lac,	Fond du Lac.
1898	Meany, John E.	Reedsville,	Manitowoc.
1896	Meesmann, Hugo	Milwaukee,	Milwaukee.
1888	Mereness, Dwight	Milwaukee,	Milwaukee.
1897	Messer, George F.	Waupun,	Fond du Lac.
1896	Metcalf, Walter B.	Lake Geneva,	Walworth.
1884	Meyer, William	Milwaukee,	Milwaukee.
1874	Miller, Clark J.	Whitewater,	Walworth.
1879	Miller, D. McL.	Oconomowoc,	Waukesha.
1893	Miller, Thos.	Oconomowoc,	Waukesha.
1889	Miller, Wilmot F.	Milwaukee,	Milwaukee.
1889	Mills, James	Janesville,	Rock.
1890	Minaban, Jno. R.	Green Bay,	Brown.
1892	Misboff, Ivan D.	Milwaukee,	Milwaukee.
1898	Moe, Anton J.	Chaseburg,	Vernon.
1896	Monroe, James	Idaho.	
1888	Monroe, William B.	Monroe,	Green.

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Year of Election.	Name.	Residence.	County.
1898	Monsted, John W.	Alderly,	Dodge.
1870	Moore, D. W.	Waupun,	Dodge.
1898	Morley, Frank E.	Viroqua,	Vernon.
1896	Moyer, Samuel R.	Monroe,	Green.
1897	Mulholland, John F.	Manitowoc,	Manitowoc.
1885	Munro, Sarah R.	Milwaukee,	Milwaukee.
1896	Murray, George Oliver	Windsor,	Dane.
1888	Neilson, W. H.	Milwaukee,	Milwaukee.
1893	Neyman, Edgar H.	Milwaukee,	Milwaukee.
1897	Nicoll, David T.	Kilbourn City,	Columbia.
1898	Nixon, Henry G. B.	Hartland,	Milwaukee.
1894	Nobles, Bryon O.	Milwaukee,	Milwaukee.
1891	Noer, Julius	Stoughton,	Dane.
1890	Nolte, Lewis G.	Milwaukee,	Milwaukee.
1898	Notbohm, Wm. R.	Delafield,	Waukesha.
1896	Nott, G. Wallace,	Racine,	Racine.
1898	Noyes, J. C.	Oshkosh,	Winnebago.
1894	Nuzum, Thos. Walter	Brodhead,	Green.
1886	Nye, F. T.	Beloit,	Rock.
1866	O'Brien, J. N.	Milwaukee,	Milwaukee.
1893	O'Brien, Jas. S.	Milwaukee,	Milwaukee.
1894	O'Connell, Richard S.	Cato,	Manitowoc.
1888	Ogden, H. V.	Milwaukee,	Milwaukee.
1890	O'Keef, Patrick	Menominee, Mich.	
1897	Olson, Ever A.	Osseo,	Trempealeau.
1898	O'Malley, Michael	Milwaukee,	Milwaukee.
1895	Orchard, Herbert J.	West Superior,	Douglas.
1897	Orr, E. D.	Mt. Hope,	Grant.
1887	Orvis, E. J.	Milwaukee,	Milwaukee.
1894	Oviatt, Chas. W.	Oshkosh,	Winnebago.
1896	Owen, William E.	Williamsburg, Iowa.	
1897	Packard, Charles D.	Rhinelander,	Oneida.
1891	Palmer, W. H.	Janesville,	Rock.
1891	Parham, G. H.	Necedah,	Juneau.
1896	Parker, Wm. E.	Whitehall,	Trempealeau.
1897	Patek, Arthur J.	Milwaukee,	Milwaukee.
1891	Peck, W. W.	Darlington,	La Fayette.
1881	Pelton, L. H.	Waupaca,	Waupaca.
1896	Pember, John F.	Janesville,	Rock.
1896	Perrin, George H.	Wauzeka,	Crawford.
1896	Perrin, H. E.	Star Prairie,	St. Croix.
1893	Perry, Fred J.	Ft. Atkinson,	Jefferson.
1898	Pfister, Franz	Milwaukee,	Milwaukee.
1886	Philler, Hugo	Waukesha,	Waukesha.

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Year of Election.	Name.	Residence.	County.
1884	Phillips, John	Stevens Point,	Portage.
1896	Pickering, Chas. R.	Muscoda,	Grant.
1896	Pinch, Francis I.	Hillsboro,	Vernon.
1896	Poser, Edward M.	Columbus,	Columbia.
1895	Potter, Luther A.	South Superior,	Douglas.
1884	Pratt, H. J.	Montello,	Marquette.
1892	Prees, Griffith W.	Cambria,	Columbia.
1890	Pritchard, J. F.	Manitowoc,	Manitowoc.
1895	Prosser, W. O.	West Superior,	Douglas.
1884	Puls, A. J.	Milwaukee,	Milwaukee.
1893	Purtell, Edward J.	Milwaukee,	Milwaukee.
1896	Quam, Jacob	Deerfield,	Dane.
1896	Ravn, Michael	Scandinavia,	Waupaca.
1885	Reed, W. A.	Necedah,	Juneau.
1892	Reeve, James S.	Appleton,	Outagamie.
1867	Reeve, J. T.	Appleton,	Outagamie.
1894	Redelings, Theo. J.	Marinette,	Marinette.
1898	Regan, Eugene D.	Milwaukee,	Milwaukee.
1883	Reineking, Herman	Sheboygan,	Sheboygan.
1895	René, J. A.	West Superior,	Douglas.
1892	Reynolds, Frank R.	Eau Claire,	Eau Claire.
1877	Reynolds, J. C.	Lake Geneva,	Walworth.
1871	Rice, John A.	Merton,	Waukesha.
1881	Richards, J. B.	Brodhead,	Green.
1896	Richter, Conrad	Hailey, Idaho.	
1878	Riddell, S. S.	Chippewa Falls,	Chippewa.
1890	Riley, Chas. P.	Baraboo,	Sauk.
1898	Rinehart, W. T.	Ashland,	Ashland.
1892	Ritchie, Geo. A,	Manawa,	Waupaca.
1895	Robey, M. L.	Grantsburg,	Burnett.
1898	Roberts, Geo. W.	Albany,	Green.
1893	Robinson, Byron	Chicago, Ill., 34 Washington St.	
1896	Rockwell, J. W.	Melrose,	Jackson.
1871	Rodgers, E. M.	Hartford,	Washington.
1893	Rodgers, Frederick C.	Milwaukee,	Milwaukee.
1890	Rood, C. A.	Reedsburg,	Sauk.
1886	Rood, Galen	Stevens Point,	Portage.
1898	Rood, John F.	Darien,	Walworth.
1890	Roos, Adolph	Oshkosh,	Winnebago.
1892	Rosenberry, Alvan J.	Oak Park, Ill.	
1895	Rosenberry, H. L.	Wausau,	Marathon.
1891	Rowley, J. C.	Prairie du Chien,	Crawford.
1867	Russell, T. P.	Oshkosh,	Winnebago.
1891	Salisbury, F. R.	Sparta,	Monroe.

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Year of Election.	Name.	Residence.	County.
1898	Sanborn, Marcus E.	Eagle River,	Vilas.
1886	Sarles, W. T.	Sparta,	Monroe.
1894	Sauer, Frederick N.	Racine,	Racine.
1886	Sauerhering, D. L.	Wausau,	Marathon.
1895	Saunders, George	West Superior,	Douglas.
1898	Sawbridge, Edwin	Stephenson, Mich.	
1889	Sayle, R. G.	Milwaukee,	Milwaukee.
1896	Schallern, Ottmar v.	Ripon,	Fond du Lac.
1890	Schaper, Charles	Sheboygan,	Sheboygan.
1896	Schaper, Herman	Kiel,	Manitowoc.
1890	Schiller, Leopold	Milwaukee.	Milwaukee.
1883	Schmidt, Philip	Milwaukee,	Milwaukee.
1883	Schneider, Joseph	Milwaukee,	Milwaukee.
1890	Schoen, A. F.	Mayville,	Dodge.
1878	Schorse, W.	Milwaukee,	Milwaukee.
1886	Schreiner, J. C.	Westby,	Vernon.
1898	Schultz, Edw. Frank	Milwaukee,	Milwaukee.
1898	Schulz, F. M.	Milwaukee,	Milwaukee.
1897	Schnetz, Thomas N.	Caledonia,	Racine.
1894	Scollard, John T.	Milwaukee,	Milwaukee.
1883	Scollard, W. E.	Milwaukee,	Milwaukee.
1893	Seaman, Gilbert E.	Milwaukee,	Milwaukee.
1890	Sears, Harry B.	Beaver Dam,	Dodge.
1885	Sercomb, Harriet F.	Milwaukee,	Milwaukee.
1896	Sharp, Mila B.	Madison,	Dane.
1885	Sheldon, C. S.	Madison,	Dane.
1887	Shimonek, F.	Milwaukee,	Milwaukee.
1892	Sifton, Harry A.	Milwaukee,	Milwaukee.
1896	Smith, Bryant,	Milwaukee,	Milwaukee.
1867	Smith, C. M.	Evansville,	Rock.
1892	Smith, C. M., Jr.	Evansville,	Rock.
1895	Smith, Chas. S.	Elroy,	Juneau.
1894	Sorenson, Soren	Racine,	Racine.
1891	Sorenson, J. S.	Shiocton,	Outagamie.
1892	Specht, John	West Superior,	Douglas.
1892	Sperry, Selden B.	Milwaukee,	Milwaukee.
1897	Sperry, Willis P.	Phillips,	Price.
1893	Stack, Stephen S.	Milwaukee,	Milwaukee.
1869	Stair, U. P.	Ft. Atkinson,	Jefferson.
1882	Stalker, H. J.	Randolph,	Dodge.
1874	Steele, Geo. M.	Oshkosh,	Winnebago.
1897	Steffen, I. D.	Antigo,	Langlade.
1896	Stephenson, Wm. L.	Brodhead,	Green.

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Year of Election.	Name.	Residence.	County.
1896	Stockley, Darwin R.	Evanston, Ill.	
1898	Stoddard, Chas H.	Milwaukee,	Milwaukee.
1898	Suiter, F. C.	La Crosse,	La Crosse.
1890	Sweemer, William	Milwaukee,	Milwaukee.
1888	Tanner, Herbert B.	Kaukauna,	Outagamie.
1898	Thayer, C. E.	Markesan,	Green Lake.
1894	Thomas, Austin H.	Hurley,	Iron.
1898	Thorndike, Wm.	Milwaukee,	Milwaukee.
1897	Thorne, James P.	Janesville,	Rock.
1892	Tibbits, Newton I.	Peshtigo,	Marinette.
1898	Tibbitts, Ulysses J.	Hingham,	Sheboygan.
1890	Tower, F. J.	Milwaukee,	Milwaukee.
1883	Townsend, E. H.	New Lisbon,	Juneau.
1898	Trowbridge, Chas. H.	Viroqua,	Vernon.
1886	Trowbridge, J. B.	Hayward,	Sawyer.
1892	Turner, Cora A.	Delavan,	Walworth.
1897	Tyrrell, Clara F.	Fox Lake,	Dodge.
1897	Valentine, L. P. A.	Western Union Junct.	Racine.
1890	Vincent, G. R.	Tomah,	Monroe.
1893	Vivian, Stansmore	Mineral Point,	Iowa.
1893	Voje, J. H.	Oconomowoc,	Waukesha.
1892	Von Neupert, Carl, Jr.	Stevens Point,	Portage.
1897	Von Neupert, Carl, Sr.	Stevens Point,	Portage.
1893	Von Szoldrski, Joseph	Milwaukee,	Milwaukee.
1894	Voorus, Clark Wesley	Beaver Dam,	Dodge.
1883	Walbridge, F. E.	Milwaukee,	Milwaukee.
1878	Walbridge, J. S.	Berlin,	Green Lake.
1898	Wallis, Jos. H.	Milwaukee,	Milwaukee.
1892	Wall, Harmon J.	Richland Center,	Richland.
1893	Walsh, Chas. Chase	Merrill,	Lincoln.
1893	Walsh, Thos. G.	Milwaukee,	Milwaukee.
1888	Washburn, William H.	Milwaukee,	Milwaukee.
1890	Watson, Clark	Cadott,	Chippewa.
1891	Wayman, S. M.	Baraboo,	Sauk.
1892	Weber, Fred. R.	Milwaukee,	Milwaukee.
1895	Weiper, H. B.	Durand,	Pepin.
1893	Wegge, William F.	Milwaukee,	Milwaukee,
1898	Werner, O. Edward	Rib Lake,	Taylor.
1895	Wetzel, T. E.	Iron Belt,	Ashland.
1894	White, Adam G.	Milwaukee,	Milwaukee.
1890	White, Moses J.	Wauwatosa,	Milwaukee.
1897	Whyte, Wm. F.	Watertown,	Jefferson.
1869	Wigginton, R. M.	Waukesha,	Waukesha.
1886	Wiley, Frank S.	Fond du Lac	Fond du Lac.

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Year of Election.	Name.	Residence.	County.
1898	Willard, S. Mortimer	Wausau	Marathon.
1897	Willson, Charles G.	Milwaukee,	Milwaukee.
1896	Williams, Theodore F.	Chelsea,	Taylor.
1880	Williams, William E.	Cambria,	Columbia.
1888	Williamson, J. L.	Milwaukee,	Milwaukee.
1892	Williamson, Luther R.	Milwaukee,	Milwaukee.
1898	Willis, Sidney S.	Appleton,	Outagamie.
1897	Windesheim, Gustave	Kenosha,	Kenosha.
1888	Wingate, U. O. B.	Milwaukee,	Milwaukee.
1898	Winslow, Rush	Appleton,	Outagamie.
1893	Wintermute, Chas. E.	Pewaukee,	Waukesha.
1885	Wolcott, Laura J. R.	Milwaukee,	Milwaukee.
1891	Woods, E. F.	Janesville,	Rock.
1898	Wray, Wm. E.	Janesville,	Rock.
1894	Wright, Frank R.	North Greenfield,	Milwaukee.
1890	Würdemann, H. V.	Milwaukee,	Milwaukee.
1890	Youmans, L. E.	Mukwanago,	Waukesha.
1889	Zeit, F. Robert	Chicago, 2718 Indiana Ave.	
1890	Zimmermann, Charles	Milwaukee,	Milwaukee.
1878	Zinns, A. J.	Milwaukee,	Milwaukee.

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HONORARY MEMBERS.

Year of Election.		Year of Election.	
1869	*Bartlett, J. K., Berkeley, Cal.	1895	Ohage, Justus, St. Paul, Minn.
1869	Davies, J. E., Madison.	1872	*Raymond, D. A., Fond du Lac
1873	*Davis, M. M., Baraboo.	1896	Reynolds, B. O., Lake Geneva.
1870	*Gorman, W. M., Milwaukee.	1870	Senn, N., Chicago, Ill.
1871	*Griffin, E. L., Fond du Lac.	——	Stone, A. J., St. Paul, Minn.
1868	Hall, Storrs, Rosendale.	1867	Whiting, J. B., Janesville.
1883	Hogeboom, C. E., Eau Claire.	1848	Wilber, G. D., Denver, Col.
1874	Monroe, Wm., Monroe.	1870	Witter, G. F., Grand Rapids.

*Deceased.

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IN MEMORIAM.—DECEASED MEMBERS.

Year of Election.	Name.	Date of Death.	Residence.
1860	Adams, Homer	———1867,	Janesville.
1878	Bading, Jno. P.	March 12, 1867,	Milwaukee.
1893	Ballard, Edward	August 8, 1896,	River Falls.
1881	Barling, Thos.		Mindoro.
1867	Barret, Moses	November 9, 1873,	Milwaukee. Ripon.
1858	Barrows, L. J.	January 14, 1895,	Janesville.
1878	Barry, Jno. S.	June 30, 1883,	Prairie du Chien.
1869	Bartlett, J. K.	November 26, 1889,	Berkeley, Cal.
1895	Beck, Chas. S.	September 2, 1895,	West Superior.
1881	Bicknell, L. C.	August 26, 1888,	Fort Atkinson.
	Bingham, R. H.	June 12, 1890,	Oshkosh.
1891	Bodenius, F. H.	July 21, 1898	Madison, Wis.
1870	Boyce, Hilton	December 6, 1875,	Geneva.
1886	Boyd, J. N.	September 10, 1892,	Madison.
1895	Bricker, Samuel R.	December 4, 1895,	Spooner.
1861	Burrall, Geo. W.		Dodgeville.
1870	Burroughs, F. V.	June 24, 1878,	Mauston.
1870	Butterfield, H. L.	June 17, 1882,	Waupun.
1856	Cameron, D. D.	August 2, 1867,	La Crosse.
1888	Carberry, J. M.	January 13, 1891,	Waukesha.
1870	Clark, S. S.		Menomonee F'ls
1868	Cody, James	October 8, 1894,	Watertown.
1886	Collins, J. M.	June, 1886,	Barneveld.
1882	Cosens, Richard	November 1, 1895,	Dodgeville.
1871	Crane, Horace O.	June 3, 1872,	Green Bay.
1867	Dalton, Nicholas	June 21, 1875,	Mineral Point.
1841	Darling, Mason C.	March 12, 1866,	Fond du Lac.
1869	Davis, J. C.	April 30, 1879,	Fort Atkinson.
1873	Davis, M. M.	May 1, 1888	Baraboo.
1881	DeVoe, J. W.	March 24, 1888.	Wausau.
1859	Dickson, John	December 25, 1875,	Allen's Grove.
1872	Dodge, E. F.	January 7, 1891,	Fond du Lac.
1854	Dousman, J. B.	February 4, 1868,	Milwaukee.
1876	Dubois, Darwin	June 29, 1879,	Lake Mills.
1887	Earl, David G.	August 27, 1892,	Lake Mills.
1868	Ellsworth, C. F.	October 19, 1877,	Prairie du Sac.
1854	Favill, Jno.	December 9, 1883,	Madison.
1868	Ferrin, Sam'l A.	March 29, 1875,	Mineral Point.
1869	Fischer, Francis M.	June 15, 1879,	Madison.

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Year of Election.	Name.	Date of Death.	Residence.
1892	Fox, William	April 12, 1897,	Milwaukee.
1873	Freeman, A. R.		New London.
1886	Frissel, C. H.	February 28, 1889,	Knapp.
1892	Fuller, E. M.	May 22, 1892,	Sussex.
1886	Galloway, W. T.	May 8, 1890,	Eau Claire.
1893	Gilmore, Chas. M.	April 9, 1897,	Markesan.
1891	Green, C. R.	February 26, 1894,	Wonewoc.
1871	Griffin, E. L.	January 25, 1892,	Fond du Lac.
1877	Hamilton, J. P.		Darlington.
1856	Hobbins, Joseph	January 24, 1894,	Madison.
1869	Hobbins, Wm.	January 6, 1883,	Madison.
1868	Hyde, Jehiel H.	December 7, 1869,	Lancaster.
1886	Howe, W. F.	January 7, 1890,	Brooklyn.
1868	Irwin, E. H.	April 2, 1892,	Lodi.
1855	Irwin, G. H.	Winter, 1864,	Lodi.
1884	Kerwin, M. H.	March 7, 1891,	Milwaukee.
1873	Lawrence, Amos	January 17, 1881,	Oshkosh.
1868	Lilly, Henry	November 28, 1870,	Fond du Lac.
1868	Linde, Christian	November 24, 1887,	Oshkosh.
1866	Linde, F. H.	April 14, 1881,	Oshkosh.
1884	Logier, W.	May or June, 1889,	Black Hawk.
1871	Lueck, A. W.	December 11, 1878,	Mayville.
1890	Manchester, D. L.	August 11, 1895,	Waupaca.
1868	Manley, Ira	December 9, 1892,	Markesan.
1870	McCall, Wm.	August 25, 1879,	Omro.
1890	McClure, Joseph F.	June 27, 1892,	Beaver Dam.
1870	Meachem, E. H. G.	August 10, 1877,	Milwaukee.
1867	Meachem, John G.	February 1, 1896,	Racine.
1869	Meacher, William	April 22, 1898,	Portage.
1890	Mendel, Jacob	November 14, 1895,	Milwaukee.
1854	Mitchell, Jno.	——— 1885,	Janesville.
1872	Meyers, Miles G.	January 18, 1880,	Wautoma.
1872	Montgomery, Thos. A.	June 16, 1876,	Wrightstown.
1889	Moore, W. W.	——— 1890,	Oakfield.
1880	Moorehouse, William D.	January 17, 1896,	Wauwatosa.
1872	Orrick J. H.		Stevens Point.
1870	Ottilie, Chas.	April 30, 1895,	La Crosse.
1870	Page, J. L.	December 10, 1881,	Racine.
1867	Palmer, Henry	June 15, 1895,	Janesville.
1854	Pease, Clark G.	June 27, 1864,	Janesville.
——	Peck, Lewis	March 26, 1887,	Hartford.
1880	Plageman, Henry	May 19, 1894,	Woodland.
1867	Quincy, Wm.		Evansville.
1872	Raymond, D. A.		Fond du Lac

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Year of Election.	Name.	Date of Death.	Residence.
1876	Regan, J. N.	October 14, 1888,	Milwaukee.
1889	Reilly, John R.	May 10, 1897,	Appleton.
1888	Reynolds, Mary	May 31, 1888,	Milwaukee.
1856	Rice, Joel		
1868	Rowley, M. C.	September 13, 1871,	Middleton.
1890	Rutherford, Alfred J.	July 11, 1896,	Milwaukee.
1856	Sayles, Cyrus		Delavan.
1856	Schul, Alex		Madison.
1870	Sperry, Johnson	January 14, 1879,	Delafield.
1896	Squire, Lucius M.	March 7, 1898,	Poynette.
1885	Strong, C. G.	March 3, 1887,	Eau Claire.
1859	Strong, H. P.	June 20, 1883,	Beloit.
1886	Templeton, J. A.		Neillsville.
1855	Thomas, Wm.		Darlington.
1870	Thorndike, Wm.	January 29, 1887,	Milwaukee.
1850	Van Dusen, Harmon	July 18, 1885,	Mineral Point.
1867	Waterhouse, M.	October 19, 1878,	Portage City.
1876	Wenzel, H. P.	January 27, 1897,	Milwaukee.
1861	White, B. F.	May 4, 1862,	Prairie du Chien.
——	Wilbur, G. D.	December 11, 1897,	Denver, Colo.
1872	Williams, J. L.		Cambria.
1871	Williams, Thomas G.	January 18, 1875,	Watertown.
1886	Wilson, J. T.		Madison.
1841 / 1870	Wolcott, E. B.	January 5, 1880,	Milwaukee.
1872	Wright, A. B.	April 2, 1886,	Oshkosh.
1859	Youmans, H. A.	October 4, 1893,	Waukesha.
1869	Youmans, Jeremiah	October 7, 1873,	Mukwanago.
1888	Younglove, Frank W.	November 22, 1890,	Wautoma.

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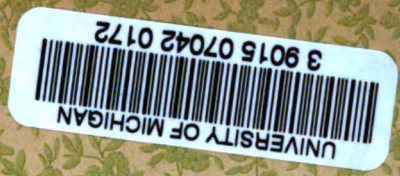

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